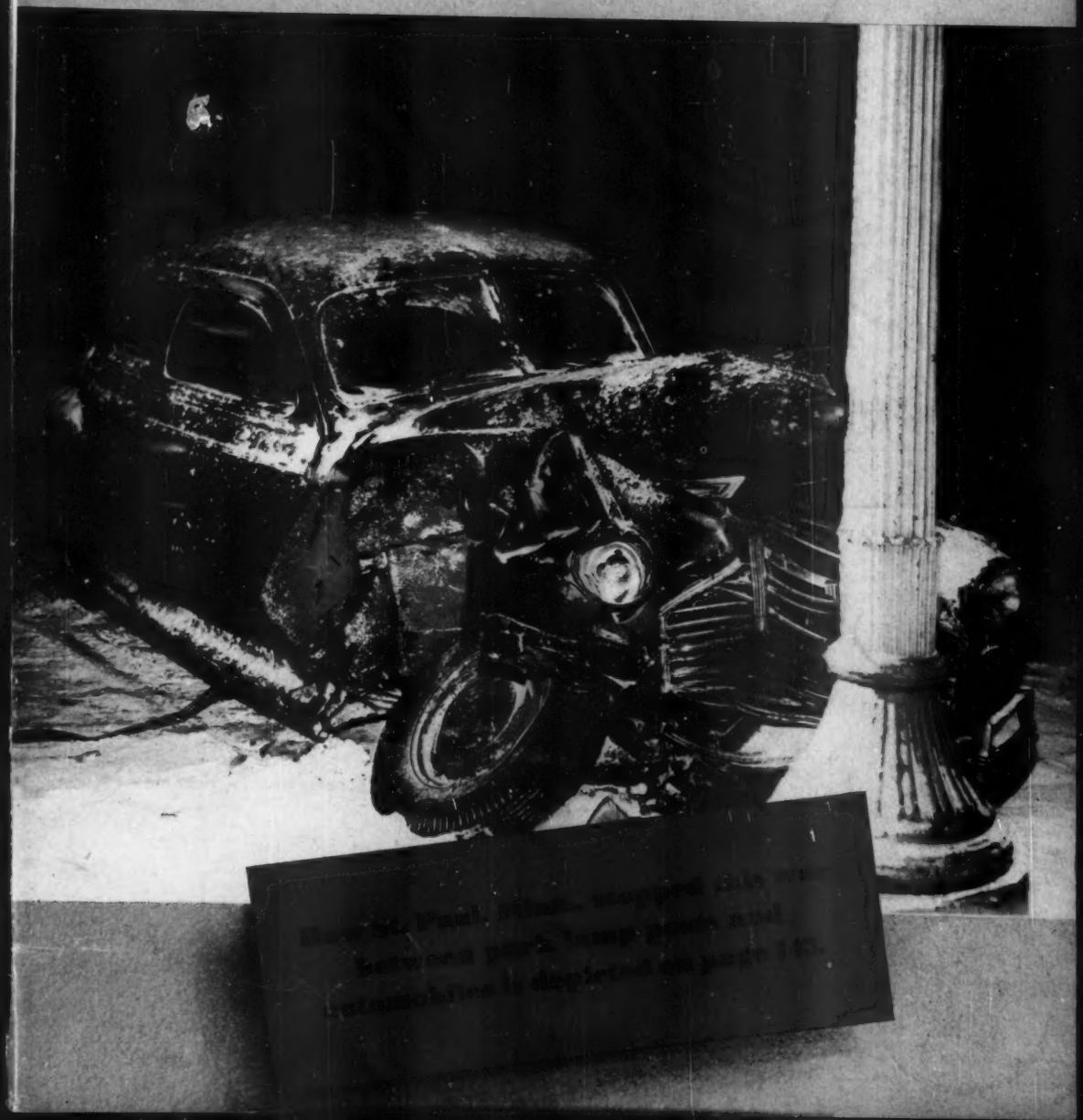
FEBRUARY 1951

The American City



Well-paved streets are the badge of a well-run city

Texaco Sheet Asphalt paving, constructed on 94,000 square yards of Broad Street, Providence, R. I., by Campanella and Cardi of that city.

Few other features of a city are as conspicuous as its streets, particularly to out-of-town motorists. No other fact so effectively advertises a well-run, progressive city as a system of well-paved streets.

The pavement on Broad Street, for example, clearly reflects the position of Providence, R. I., as one of New England's outstanding cities. This section of Broad Street is paved with 94,000 square yards of resilient, heavy-duty Texaco Sheet Asphalt, laid in two courses, consisting of 1½-inch binder and 1½-inch wearing surface. The same durable, low-maintenance type of asphalt construction has been laid on a substantial portion of this leading city's street system.

Providence is another of the more than 1500 representative U. S. Cities which have paved with Texaco Asphalt during the past 45 years.

Two helpful booklets which describe all types of Asphalt construction suitable for city streets can be obtained by writing our nearest office.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

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TEXACO

REG. T.M.

TEXACO ASPHALT

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THE MUNICIPAL INDEX and ATLAS, used in connection with the current advertisements in THE AMERICAN CITY, places officials in the most favorable position to obtain all types of available equipment and supplies from manufacturers who desire to serve municipal government departments. This 835-page annual is published by The American City Magazine Corporation, 470 Fourth Ave., New York 16, N. Y.

See pp. 23, 24, 26, 30, 34, 149, 151, 153, 155, 156, for catalogs and publications on municipal subjects.

List of Coming Conventions, page 134

Index to Advertisers, page 214

Copies of this issue printed, 21,500

Career girl, 1965

Little Miss Telephone herself. Thirty-five members of her family have worked for the telephone company.

That's Karen Terry — She's just three and cute as a button. Already she's decided to be a telephone operator when she grows up.

There are many reasons for her choice. For Karen is related to an interesting telephone family in California. Thirty-five members of this family have worked for the telephone company in the past sixty-five years. Many still do.

Lots to Talk About — When Karen's Aunt Ella was asked what the dinner conversation is like when they get together, she said — "Why we talk shop, of course. All about the telephone company and our friends there."

It's that way with thousands of other families. One Bell Telephone Company found that 2800, or ten per cent, of its employees had members of their families in telephone work.

Stepping Ahead — A young man doesn't follow his Dad in a job unless Dad says, "Come along, son — you'll find it as good a place as I did." You won't find sister following sister, and brother following brother into telephone work without reason. They like the work and the company.

Good people in good jobs help to give this country the best telephone service in the world at low cost.

BELL TELEPHONE SYSTEM

Our Municipal Notebook

Municipal Needs To Receive Attention In Mobilization Effort

UNLIKE the situation during World War II, it now seems likely that the construction and supply needs f municipal governments will be given adequate consideration and met equitably, if and when priorities and allocations go into effect. This is the report of Mayor David L. Lawrence of Pittsburgh, president of the United States Conference of Mayors, and Paul V. Betters, the Conference executive director, who have visited and discussed specific recommendations with both President Truman and Charles E. Wilson, Director of Defense Mobilization.

In a memorandum to the President, Mayor Lawrence and Mr. Betters urged that a single division be established within the Office of Defense Mobilization to be concerned with government essential construction, supply, and equipment needs. They pointed out that while specific industrial interests are strongly and properly represented in policy-planning for the mobilization effort, there is no similar advocate for government needs. They said that the public interest must also be secured.

Our production machinery cannot function without water, sewage disposal, police, and fire services, the memorandum declared. There was a serious impairment of the war effort in the early days of World War II mobilization as communities struggled to obtain essential structures, materials, and equipment. It took far too long to establish and staff adequately a Government Requirements Bureau in the War Production Board.

Mr. Wilson has now stated unequivocally that there will be set up in the near future, before any freeze orders are issued affecting the cities, a unit in the over-all mobilization organization to look after municipal requirements.

Municipal Exemptions From Wage-Freeze Order

IN a special bulletin issued on January 27, Paul V. Betters, executive director of the U. S. Conference of Mayors, reported that no federal order "can constitutionally affect cities and states or the wages or salaries paid by cities and states to their employees." He stated that "the relationship between employees of a government, whether it is federal, state, or city, is entirely different in law from the established relationship of private employers and their employees."

New USO Formed to Help Communities Meet the Servicemen's Needs

CITIES planning recreational and other morale services to the Armed Forces this year must plan to utilize local facilities and funds to the maximum because of emergency demands on the limited resources of national organizations.

That is the warning from officials of the USO, formed late in January by the amalgamation of United Service Organizations and Associated Services for the Armed Forces. The new organization has temporary headquarters at 41 East 42nd St., New York 17, N. Y. Its member agencies are the Young Men's Christian Association, National Catholic Community Service, National Jewish Welfare Board, Young Women's Christian Association, Salvation Army, National Travelers Aid, and Camp Shows.

Priority of Funds

First priority on funds available nationally goes to communities with heavy military overload and limited resources, it was explained. Priorities are determined after consultation with Defense Department officials as well as on-the-scene surveys. On this basis, budgets had been approved by ASAF for approximately 30 club facilities in addition to the 101 it was operating prior to Korea. Until additional funds can be raised—probably in time for 1952 operations—there are no funds forthcoming for increase of these activities.

Meanwhile, however, a number of communities have gone ahead with locally financed USO facilities, with the full cooperation and counsel of local USO committees and of the national staff. Chicago, St. Louis, and other cities in all parts of the country have opened clubs, lounges, information booths, stations, and other facilities needed to meet servicemen's needs.

USO officials urge mayors and civic groups to work closely with local USO committees in developing plans for services which might be needed locally. If the need is acute, these committees will be able to advise national USO headquarters of the facts in order to secure priority consideration for the community. In meeting the needs locally, the committees can call on the know-how and experience of USO headquarters and field staff.

United Defense Fund Established

Aid in financing health and welfare services made necessary by the defense effort will be furnished by the United Defense Fund, Inc., a federation composed of local community chests, citizens acting through the National Social

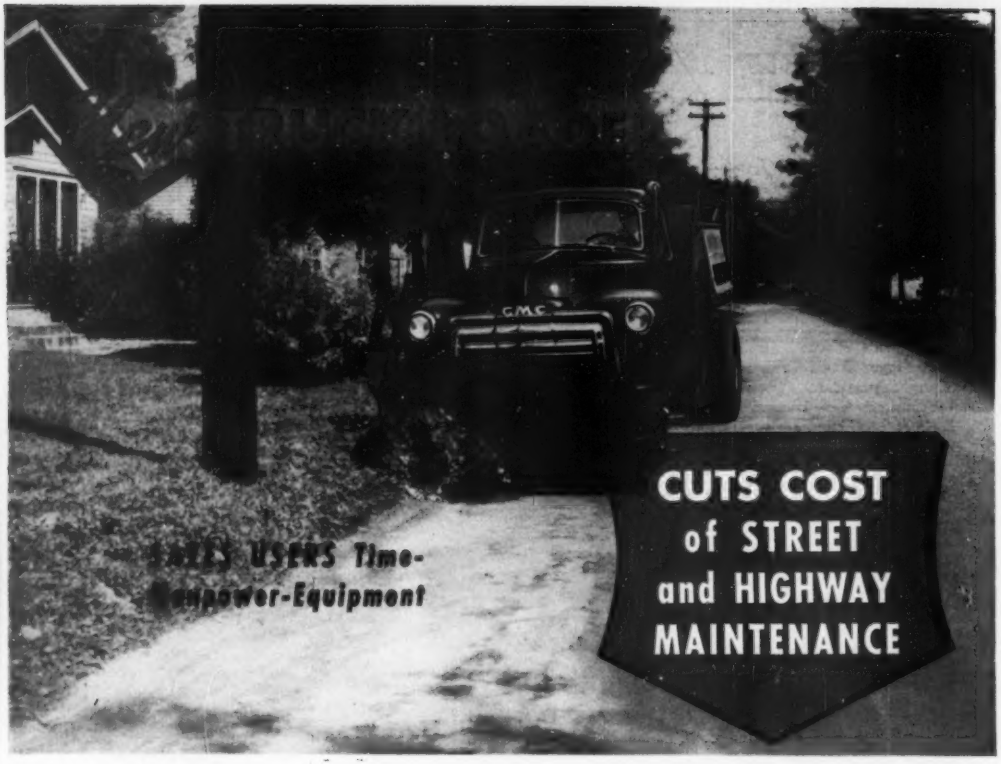
The American City Quiz

Match Wits with the Experts

QUESTIONS

1. ***What percentage of water mains is laid by water-department forces?***
2. ***Is it necessary to compact coarse-grained material when building subbases for roads and streets?***
3. ***How extensive is the use of a phosphate inhibitor with salt to prevent possible corrosion of auto-underbody parts?***
4. ***What city makes the greatest use of groundwater for public water supply?***
5. ***What standards exist which govern the purity of bathing beaches from a pollution standpoint?***
6. ***How often should vacuum filters used in sewage-treatment plants be cleaned?***
7. ***How much of the imposts raised from highway use are spent on the city's roads and streets?***
8. ***How small a city can advantageously own and operate a hot-mix asphalt plant for street-maintenance purposes?***
9. ***Where is America's largest city park?***

(Answers on page 9)



THE NEW Holmes-Owen Loader offers a very practical solution to the problem of today's increasing cost, on street and highway maintenance jobs. The installation of a self-loader reduces the cost of such operations for with this driver-operated unit, one man now does the work of several. The versatile one-man operation of a loader-equipped truck, not only speeds up material handling but substantially reduces the cost per ton handled. It saves time, labor and equipment by permitting the truck driver to do his own loading, hauling, and unloading without extra help or the use of more costly equipment. The new truck loader is today being profitably used by states, municipalities, contractors and numerous commercial and industrial firms. Write factory today for details on this unit which is unsurpassed for handling stock pile materials, snow removal, cleaning-up and dozens of other practical uses.

Manufactured by
Makers of HOLMES WRECKER Equipment

Permits DRIVER to LOAD, HAUL, DUMP, Do Light DIGGING, Grading, Cleaning-up

ERNEST HOLMES COMPANY
Chattanooga, Tennessee

Welfare Assembly, Inc., and Community Chests and Councils of America, Inc. The greater part of the Fund's budget is for services to the armed forces; a smaller amount is for services to communities congested by defense efforts.

Ralph H. Blanchard is Executive Director of the Fund, whose temporary address is at 155 East 44th St., New York 17, N. Y. The Fund was organized to prevent the waste of manpower and moneypower that would result from separate campaigns, and also to assure that appeals of national organizations to community chests and to American communities, particularly in time of special need, be properly screened, budgeted, and united in their financing. The Fund will seek its entire budget from those communities which have community chests, plus New York City.

Budgets included in the United Defense Fund, Inc., are in two categories: Services for the Armed Forces, and Community Services for Civilians. In the latter group, which will aid civilians in communities congested as a result of the defense effort, the following agencies will participate in 1951: Child Welfare League, National Organization for Public Health Nursing, National Federation of Settlements and Neighborhood Centers, National Urban League, National Catholic Community Service, National Travelers Aid Association, National Recreation Association, and Young Women's Christian Associations.

The National Recreation Association, which has served the country in World Wars I and II, and is included in the United Defense Fund, is aiding both the Armed Forces and communities concerned with defense-recreation problems by providing special services.

New Report on Air-Pollution Control

AIR-POLLUTION control in some form has been adopted by nearly every city with a population over 250,000. The State Legislatures of Pennsylvania, New Hampshire, and New Jersey have appointed legislative committees to consider air-pollution-control legislation. The Federal Government sponsored a conference on air pollution last May.

The Planning Advisory Service of the American Society of Planning Officials has prepared an Information Report * on air-pollution control as a guide to the action which has been undertaken on a state and local level, the legal interpretation, costs of air pollution, and the benefits to be achieved from its control. A sample air-pollution ordinance is also included in Report No. 20, issued to Planning Advisory Service subscribers.

* Reports are available only through subscription. For information, write to the American Society of Planning Officials, 1313 East 60th St., Chicago 37, Ill.

Presidential Water Resources Study—How It Looks to the Municipalities

A YEAR AGO last month, President Truman appointed an exceptionally well-qualified committee to formulate a water policy for this nation.

Never before in our history, we believe, has the attempt been made to appraise our total water resources and decide on their best uses. The Corps of Engineers, informally considered as consultants to Congress in this field, never have tried it. The U. S. Geological Survey has been patiently gathering data on water resources, both in surface streams and in the ground, for more than a quarter-century—and it has much more to do before this valuable work is completed.

Nevertheless, the President's Water Resources Policy Commission delivered a report * in less than a year. This speed is phenomenal. Frequently engineers require more than twelve months to study a single city's water supply and to recommend a rational water policy. Yet, here we have a policy proposed for the entire nation, assembled, appraised, and delivered in less than a year.

However, this should not of itself discredit the report. The men who made it have spent many years in these fields and undoubtedly drew upon many existing studies in compiling and evaluating their basic data.

Reactions to Such a Report

Whenever a report takes a definite stand on a controversial question, its proponents have to tread on someone's toes. This report is no exception. Conservation interests have expressed a dislike for some of the findings. The power industry—chiefly the private power industry—has expressed serious dissent.

In attempting a calm appraisal, one should have in mind a principle that should guide all governments that use free enterprise as the cornerstone of their economy. That principle may be summarized as follows:

If a service is needed for the well-being of a local community, a state, or the nation, and if private enterprise is unable or unwilling (with fair treatment and reasonable regulations) to supply this service in an adequate manner, then the local, state, or national government must provide that service as a public function.

To that principle, as applied to the report under discussion, we would make the following addition that we feel is most important:

Such governmental service, when established, should be so organized that its policies will reflect the wishes and needs of the area affected.

For adequate conservation and use of our water resources, the Presidential Commission leaned heavily on the "river-basin-authorities" device, rather than proposing a new national authority to govern all our water resources. The wisdom of this is obvious. No one to our knowledge has questioned it. Yet, remarkably enough, one of the Commission members, Samuel B. Morris, is general manager of the Los Angeles Board of Water and Power, an organization that reaches not only through its natural drainage area, but across a great range of mountains for its water.

Pay Equivalent of Taxes

The Commission recommended that federal funds be used to finance river-basin authorities and that boards of some type be established to administer the work, arguing that the projects of this magnitude are outside the resources of private capital. In our opinion, this is, in general, a correct assumption. Nor do we believe private capital would be interested in soil conservation, shipping, pollution abatement, and the other facets of complete water-basin development.

The report takes a sound stand, we believe, by recommending that domestic and industrial water supply and hydroelectric power pay, with interest, their appropriate share of the program investment; and that they pay, in addition, an amount equivalent to local and state taxes that would have been paid on acquired properties. We suggest further that such payments take into account also the equivalent of federal taxes that a privately owned utility must pay.

Special Favors Urged for Irrigation and Farming

The report urges special favors for irrigation and farming purposes, based on "ability to pay." We cannot be sympathetic to this. Food-production is important; but so is the supply of water for our communities, and the production of electricity. In THE AMERICAN CITY's opinion, there is no justification for making water and electricity users pay their full share of basin-development costs, and then subsidizing landowners or farmers under a questionable and nebulous principle of "ability to pay."

The Water Policy report recommends that the various federal departments concerned with water-resources programs be represented on the proposed

* See pages 83 and 84 of this issue.

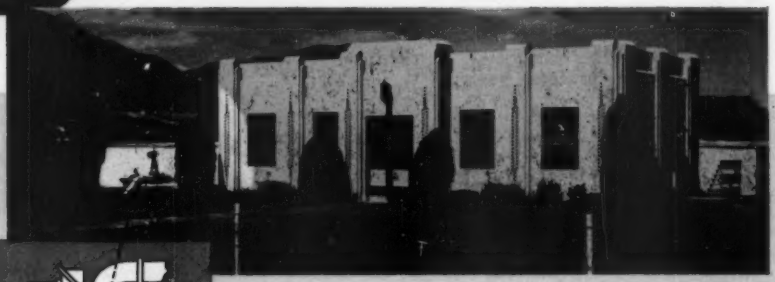
another

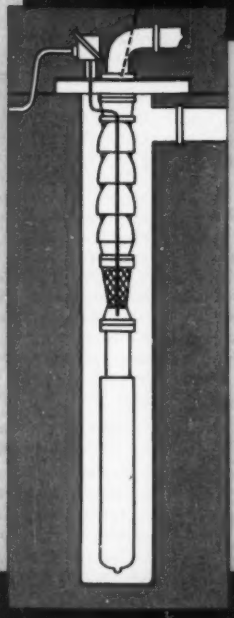
BJ

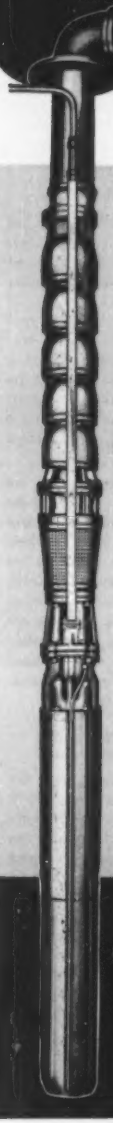
submersible pump

case history

El Paso's Invisible Pumping Station saves money, saves maintenance, and safeguards water supply in times of emergency







Installation was economically achieved by simply sinking a steel casing sealed at the bottom with concrete. The 200 hp, 2000 gpm BJ Submersible is suspended in the casing, draws water from the reservoir, and discharges into the main line. The marine power cable connects to a simple starting panel. When desired, BJ Submersible Stations can be completely underground.

The old and the new in pumping stations...

FIFTEEN YEARS AGO, the City of El Paso built a pumping station housed in the building above. This station uses 100 sq. ft. of space per mgd of pumping capacity, requires operating supervision and building maintenance. Now, El Paso has built another pumping station using a Byron Jackson Submersible Pump. This new, invisible booster station *uses only 12 sq. ft. of space per mgd, needs no pump house, and requires no operating supervision or building maintenance!*

According to E. Nevins, Production Superintendent of El Paso's Water Department..."today we feel that there is no real justification for a pump house. We have had such success with these submersible pump and motor combinations that all our future stations and wells will probably have them. Certainly, water-works officials will feel a lot better if their important pumping stations are underground, away from possible air attack and in a place difficult to sabotage."

BJ Submersible Pumps can help your city save unnecessary real estate investment, construction costs and maintenance expense, and safeguard your vital water supplies in time of flood, fire, war or other emergency. Pumping capacities to 20,000 gpm are possible and heads to 1500 ft. For additional data send coupon below or call your local Byron Jackson office.

Byron Jackson Co. Dept. No. 50
P.O. Box 2017 Terminal Annex
Los Angeles 54, Calif.
Send me full data on the BJ Submersible

NAME _____

POSITION _____ DEPT. _____

CITY _____ STATE _____

basin authorities. Cooperation of federal agencies in coordinating national and local programs is obviously essential. But to prevent undue centralization of authority, it seems desirable that the membership of each basin authority be drawn preponderantly from its own region. The members might be appointed by the affected states, as in the case of some port authorities; or they might be drawn from representatives of cities, towns, and counties in the area, as is the case of certain water districts; or they might be chosen by other suitable means which will combine democratic, responsive control with efficiency of administration.

Tax Institute Reports Total Tax Collections In the United States

AN ALL-TIME HIGH of over $57,000,000,000 in tax collections — federal, state, and local — for the year 1950 is predicted by the Tax Institute in a recent bulletin on Tax Collections.*

For 1949 the Institute computes the total (including payroll taxes) at $56,481,000,000. Local governments' share in this total is estimated at $7,424,000,000, an increase over the previous year of some $800,000,000.†

Local and Total Percentages

Property taxes continue to account for nearly 90% of local tax collections, but as shown in the following table, property taxes are less than 13% of total tax collections. Local sales- and income-tax collections gained percentage-wise as well as in dollar amounts during the year. Exclusion of payroll taxes, revenue sources, and yields for the entire United States in order of fiscal importance in 1949 were:

Tax	*Total all units*	*Percentage of total collections*
Income	$30,896,000,000	58.27
Property	6,843,000,000	12.91
Alcoholic beverages	2,713,000,000	5.12
Gasoline	1,946,000,000	3.67
General sales use, and gross receipts	1,859,000,000	3.51
Tobacco	1,710,000,000	3.23
Motor vehicles	1,434,000,000	2.70
Inheritance, estate and gift	976,000,000	1.84
Customs	384,000,000	.72
Other	4,257,000,000	8.03
Total	$53,018,000,000	100.00

Payroll taxes in 1949 for unemployment insurance and old-age benefits totaled $3,463,000,000.

* The November 1950 *Tax Policy* bulletin (8 pages) from which the foregoing figures are taken is available at 25 cents from The Tax Institute, 150 Nassau St., New York, N. Y.

† The local-government totals include tax collections of municipalities, counties, school districts, townships, towns, and special districts.

UNAJ Donates Cherry Trees to American Cities

THE United Nations Association of Japan, and the Friends of the United Nations, of Tokyo, Inc., have announced an offer of 10,000 cherry-blossom trees to be divided among several American cities.

In accepting 2,000 of these trees for Seattle, Mayor William F. Devin expressed the appreciation of the City Council and the Park Department, with assurance to the Japanese organizations that this gesture will be a constant reminder of the friendship between our two nations, which it is hoped will endure forever.

In a letter to THE AMERICAN CITY, Mrs. Walter Sterling Price, director of the Northwest Headquarters of the American Association for the United Nations writes:

We here on the West Coast, so close to our neighbors in Asia, seek every opportunity and avenue to promote friendship and understanding between our peoples, and these cherry blossoms framing our blue lakes will gladden the eyes and lighten the hearts of all who see them. Some time ago our Rose Society sent roses from Seattle to Japan, and I understand plans are under way to do this again. All of this helps build a firm foundation for our United Nations.

The United Nations has formally accepted 50 full-grown trees to be used in landscaping its permanent headquarters site, and the New York City Park Department has agreed to take 1,000 seedlings to mature in Park Department nurseries.

Other cities to which the trees are being offered include Portland, Ore., San Francisco, Milwaukee, St. Paul, and Minneapolis.

The National Council of Parents and Teachers Associations, Japan Importer-Exporter Publishing Corp., and *Mainichi Shimbun*, of Tokyo (a major newspaper), are also cooperating in this project.

"The American City" In Microfilm

A microfilm edition of THE AMERICAN CITY for the 12 issues of 1949 is available to subscribers, to be followed soon by the 1950 volume. This service is being performed by University Microfilms, 313 N. First St., Ann Arbor, Mich. Orders already reported for the 1949 volume include 19 public libraries, and 12 colleges and universities. The microfilm edition sells for $6.65 for the complete Volume 64 (1949), and for 7.55 for Volume 65 (1950).

The American City Quiz

ANSWERS TO QUESTIONS ON PAGE 5

1. According to a poll of 38 water superintendents, taken in a Wisconsin waterworks meeting, 21 laid mains with their own forces and 17 laid them by contract. Some of the latter furnished materials.

2. Coarse granular material requires compacting for fill purposes, just as does fine material. Roy L. Greenman, Soils Engineer Michigan State Highway Department, found volume changes of 19% in the coarse material. Compaction can be achieved by hand-tamping, by machine-tamping in 6-inch layers, or by self-propelled surface vibrators that give compaction to depths of 12 inches.

3. Last year, more than 100 cities used the phosphate, Banox, with salt. One firm, Carey, offered salt pre-mixed with 1% Banox.

4. The greatest use is in Houston, where an average demand is 60 mgd. The total from the Houston area is 300 mgd.

5. According to Dr. Abel Wolman, Professor of Sanitary Engineering at Johns Hopkins University, considerable confusion exists on bathing-beach standards. Some are higher than 120 coliform organisms per 100 ml, attainable only in lakes and excellent tidal waters. Counts as high as 240-1,000 coliforms have been found in streams with no more than animal contamination. West Virginia gives "A" classification with a count as high as 1,000. New York City gives tentative approval with counts to 2,400.

6. Kerwin Mick, Chief Engineer of the Minneapolis-St. Paul Sanitary District, first set a schedule of one cleaning each 24 hours, later reduced it to once every eight hours, and then later to once every four hours. Each time, he was able to reduce the amount of sludge-conditioning chemicals. Now he places spray nozzles immediately behind and below the top edge of the take-off plate of the filter. This makes washing possible on the section of the drum between the cake take-off and the line of submergence in the filter pan. One filter is washed once each hour for at least one drum revolution.

7. For 1948, the U. S. Bureau of Public Roads' figures showed that 11% of the imposts raised from highway use went to the maintenance of city streets, even though more than half the traffic travels those streets. County and rural highways received 21%; state highways outside cities received 54%; 9% was diverted to non-highway uses, and 4% went for administrative costs.

8. No sliding scale has ever been established; but Crown Point, Ind. (population 5,000), appears to be one of the smallest. This city uses a Barber-Greene Model 830-40 plant, figures the in-place cost of surfacing at $6.50 per ton, or half the prior cost.

9. Probably Phoenix, Ariz. Its South Mountain Park covers 14,000 acres, has typical craggy terrain, 26 miles of auto trails, and 40 miles of saddle trails.

Send in your suggested questions with the answers on municipal topics for use in this feature. THE AMERICAN CITY will make a small payment for each question accepted.

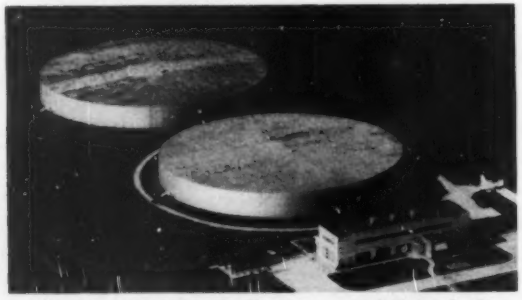
The 5,000-000-gallon reservoir shown at the right is 210 feet in diam. and 20 ft. high. It is the newest of Houston's reservoirs.

THEY ALWAYS DO THINGS IN A BIG WAY IN HOUSTON

WHEN booming Houston, Texas, undertakes to do anything, you can be sure it will be done in the biggest and best way possible. And when the welfare of its 500,000 population is concerned, there is no compromising. That's what makes this city one of the most modern and progressive in America.

Consider the problem of an adequate water supply.

Almost every city in the country has had water problems these past few years. It has been generally attributed to the natural growth of population and to the general lowering of the continental water level. What had once been adequate facilities in many cities, have now become lacking.



Above: Two 5,000,000 gallon Horton reservoirs built for the City of Houston several years ago. Both are of welded steel construction.

However, in Houston, where the situation might be especially serious with the rapid rise in population, farsighted planning has been able to overcome such difficulties. New additions to the water system have made the difference. Pictured here are three of the biggest additions . . . three Horton welded steel reservoirs with a total capacity of 15,000,000 gallons.

This giant reserve of water helps supply the daily needs of Houston today . . . and will continue to do so for years to come. For these tanks do not develop cracks or leaks even if there is uneven settlement. Their smooth welded steel surfaces are also easier to paint to insure low cost maintenance.

Many cities throughout the country are finding that Horton reservoirs are answering their large storage problems. They are built in capacities up to 10,000,000 gallons.

We also build elevated steel tanks of welded construction ranging in sizes from 15,000 to 500,000 gallons with ellipsoidal bottoms and from 500,000 to 3,000,000 gallons with radial-cone bottoms.

Write our nearest office for estimating figures on Horton tanks to improve your water system.

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Birmingham 1	1502 North Fiftieth Street	Havana	402 Abreu Bldg.	Salt Lake City 4	501 West 17th South St.
Boston 10	1002—201 Devonshire St.	Houston 2	2101 National Standard Bldg.	San Francisco 4	1533—200 Bush St.
Chicago 4	2127 McCormick Bldg.	Los Angeles 17	1503 General Petroleum Bldg.	Seattle 1	1301 Henry Bldg.
Cleveland 15	2236 Guildhall Bldg.	New York 6	3308—165 Broadway Bldg.	Tulsa 3	1625 Hunt Bldg.

Plants in BIRMINGHAM, CHICAGO, SALT LAKE CITY and GREENVILLE, PENNSYLVANIA

Water Supply and Treatment

Fluoridation Improves Dental Health in Three Cities

FLUORIDATION of the public water supply as a dental-health measure chalked up another advance for itself where the results at Grand Rapids, Mich., were reported by the U. S. Public Health Service. (*Public Health Reports*, No. 43, Vol. 65.)

Fluoridation has run for five years in Grand Rapids. Analysis of the 1949 dental examinations shows a reduced amount of dental-caries experience when compared with the pre-fluoridation rates of 1944-45. The findings indicate that the reduction is most pronounced in the younger-age groups whose dentition was largely calcified following the addition of one part per million of fluoride to the previously fluoride-free public water supply. Sufficient time has not elapsed to evaluate water fluoridation in the older groups, the report states. The reduction averaged about 30% in age groups ranging from four to eight years.

Grand Rapids was one of three cities who were selected for specific study of the action of artificial fluoridation in the public water supplies. Another city was Muskegon, Mich., whose source of drinking water and climatological characteristics were similar to those of Grand Rapids. In addition, data were collected for direct comparisons with dental caries rates in Aurora, Ill., where the naturally occurring fluoride concentration of the public water supply is 1.2 ppm. The base-line information collected consisted of detailed examinations of virtually the entire school population of the three cities.

In the Grand Rapids fluoridation program, sodium fluoride, over 90% pure commercial grade, was used as the source of fluorine. Automatic feeders were employed to control the amount of sodium fluoride fed into the water supply. Daily tests assured maintenance of a uniform concentration of 1 ppm.

The report of the Grand Rapids findings was prepared by H. Trendley Dean, Francis A. Arnold, Jr., Philip Jay, and John W. Knutson. Doctor Dean and Doctor Arnold are Director and Associate Director, respectively, of the National Institute of Dental Research. Doctor Jay is a professor at the School of Dentistry of the University of Michigan. Doctor Knutson is Chief of the Division of Dental Public Health of the U. S. Public Health Service. Co-operating in the study with the Public Health Service were the Michigan State Health Department and the University.

The table reports dental-caries experience, observed among 27,308 children, ages 4-13, of Grand Rapids, Muskegon, and Aurora, expressed as decayed, extracted, or filled teeth per child with percentage reductions observed (continuous residents).

	Grand Rapids, Mich.			*Aurora, Ill.*		*Muskegon, Mich.*		
Age	*Caries experience* 1944-45	1949-50	*Percentage reduction*	*Examinations* 1945-46	*Percent less than G.R.* 1944-45	*Caries experience* 1944-45	1949-50	*Percentage less*
4	4.2	2.7	35.7	2.1	50.0	...	4.4	....
5	5.4	3.3	38.9	2.8	48.2	6.8	5.6	17.7
6	6.4	4.6	28.1	3.4	46.9	7.2	6.0	16.7
7	6.3	4.8	23.8	3.5	44.4	6.7	...	....
8	5.8	4.7	19.0	3.6	37.9	6.1	...	....
9	4.6	4.4	4.3	3.0	34.8	4.9	4.5	8.2
10	2.8	2.9	3.6	2.3	17.9	3.1	2.8	9.7
11	1.3	1.2	7.7	1.2	7.7	1.3	1.2	7.7
12	.5	.4	20.0	.4	20.0	...	...	....
13	.2	.1	50.0	.1	50.0	...	...	....

No Frozen Fire Hydrants in Middlebury, Vt.

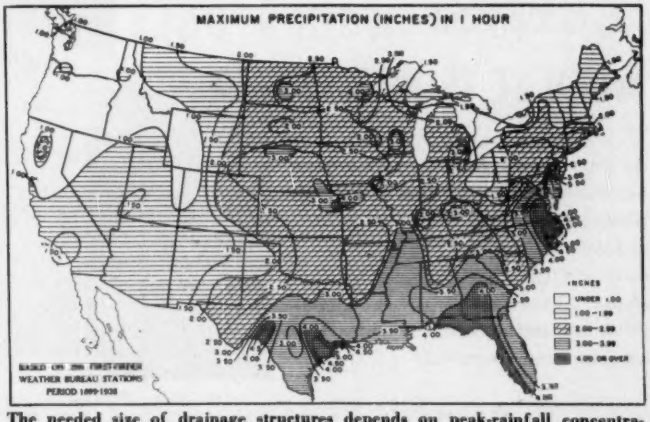
A 23% salt solution placed in the fire-hydrant barrel keeps fire hydrants from freezing in Middlebury, Vt. And a ½- to 1-ounce addition of Banox to the salt solution keeps the salt brine from corroding the hydrant barrel. This solution keeps the freezing point about 5° below zero and is about as low as can be obtained with salt.

The procedure was developed by Ernest E. Lothrop, Municipal Manager of Middlebury. To test the corrosive action, he mixed 50 gallons of the solution in a steel barrel that had been scratched and scraped thoroughly so that the bare metal showed. Exposure of the metal to the brine for several weeks did not show any corrosion, Mr. Lothrop stated.

The salt-Banox solution was used during the winter of 1949-50 and caused no trouble with valves or gaskets during the entire winter.

The use of salt in fire hydrants is a time-tested practice in Vermont, according to Edward L. Tracy, Director of Sanitary Engineering in the Vermont Department of Health, and is one of the most practical methods to prevent freezing of hydrants.

Peak Rainfall in the United States



The needed size of drainage structures depends on peak-rainfall concentration. This U. S. Weather Bureau chart gives records on maximum rainfall.

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FLEXIBLE KEYBOARD...
of tempered spring-steel permits obstacles in material to drop through without clogging or marring spread pattern.

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  fully automatic, free-wheeling gear box
- INSTANTANEOUS SHUT-OFF
  a one-lever operation
- POWDER FINE CARPET SPREAD TO A 3-INCH DEPTH
  controlled by Micrometer Depth Adjustment
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  oversize particles work through Flexible Keyboard without emptying hopper
- SPREAD HEAVY ON ONE SIDE . . . LIGHT ON THE OTHER
  utilize Taper Attachment for this effect
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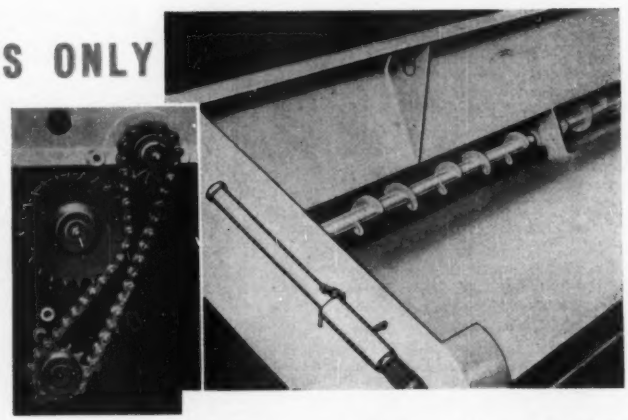
  positive Locking Automatic Hitch

AUTOMATIC AGITATOR WORKS ONLY WHEN IT IS NEEDED



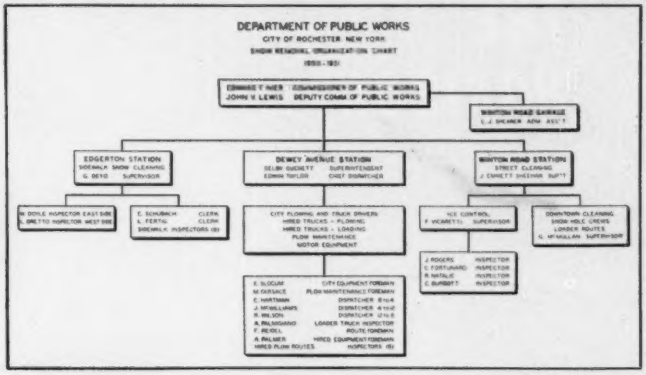
Agitator driven from feed roll turns automatically in same direction as roll whether spreading forward or reverse, and assumes neutral position without shifting gears when keyboard is closed. Inset shows outer agitator drive mechanism which is completely encased when assembled.

GOOD ROADS MACHINERY CORP. MINERVA, OHIO

Street Cleaning and Snow Removal

Snow Removal Organization Chart ▶

The reputation of Rochester, N. Y., for excellence in snow removal is maintained by a combination of good equipment and smooth organization. This schedule shows how Public Works Commissioner Ed Nier organizes his department for snow removal, ice control, and sidewalk snow plowing.



Radiant Heat Snow Removal— What Does It Cost?

THE cost of removing snow by electrical elements cast in the pavement is just about what the original engineering estimate forecast. This was disclosed by the Michigan Highway Department in a report of last year's radiant-heat snow-removal work on a Detroit ramp.

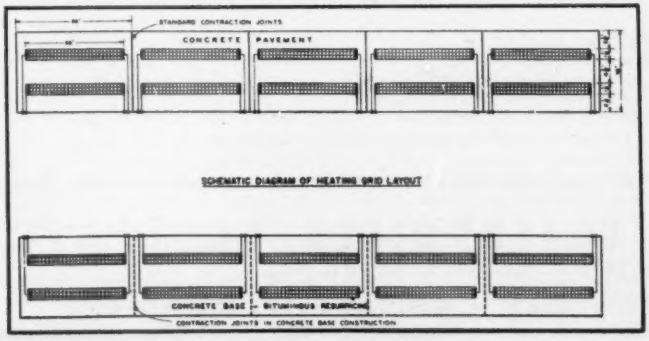
Detroit uses electric panels to keep snow clear of a 500-foot ramp to a superhighway. Each installation is 98 feet long, uses 2-by-2-inch mesh of No. 14 galvanized-wire fabric 18 inches wide. This length was selected to form the interval between pavement joints. These provide 18 inches of ice-free path for each wheel. At the ends of the heaters are ¼-by 2-inch copper bar and terminal wires, brazed to allow connection to the power source. The elements are placed 2 inches below the surface of the concrete, or 1¼ inches below the asphalt surface. This provides 55 watts per square foot. The wires are dipped in insulating varnish. The circuits are 60 volt with a maximum drop of 0.3 volts per foot. The panels require 40 kw-hrs. per hour per 500 feet of ramp section. At 2½ cents per kw-hr., they cost $1 per hour to operate.

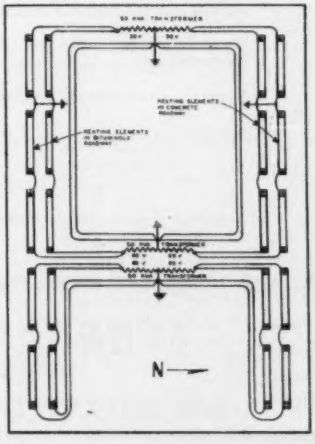
The data for the past winter season disclosed these facts:

1. That the cost for power used for the entire installation was $1,041, which was within the estimate predicted for a normal winter snowfall of approximately 40 inches. The actual snowfall was 41 inches.
2. That the power consumption for the bituminous section was greater than that of the concrete section by 5%. This was attributed to the shallower depth of the heating elements in the bituminous section and the difference in relative thermal conductivity of the two pavements.
3. That the power consumed per 500-foot section per square foot of heated area is approximately half the design value, thus indicating that the heating elements are "on" only about half the time.
4. That the present installation is hampered by the fact that it is in use on a flat area where no special drainage facilities were supplied. Thus the water tends to form an insulating layer over the heated areas and imposes an added burden on the heating installation.

The system operated a total of 549 hours from November 20, 1949, to April 13, 1950. Minimum air temperature was 12° F. The cost to operate the two 500-foot sections was $1.89 per hour.

The heating elements went into the pavement in the manner illustrated below Wiring of heating elements was according to the diagram shown at the right.





BEYOND THE HORIZON

Beyond the horizon a glowing threat that may be a portent, casts its lurid reflection upon all of us. We recognize the glow as an incipient world conflagration that may overwhelm our nation's greatest efforts of prevention.

To survive we cannot be supine. Survival may depend on speedy evacuation in those too few moments between warning and disaster. Time remaining is the unknown quantity. Do not squander it.

YOUR COMMUNITY DEPENDS ON A COMPLETE AND ADEQUATE AIR RAID WARNING SYSTEM—DO YOU HAVE IT? Could you justify its total lack or inadequacy?

Prepare now with the best and only completely dependable warning system—FEDERAL SIRENS.

Federal Vertical Sirens radiate the sound

Federal Vertical Sirens are always ready for action

Federal Vertical Sirens provide greater coverage per dollar expenditure

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Sewerage and Sewage Treatment

Sewage Works Financing Methods

APPARENTLY state authorities are more ready to order a municipality to build a sewage-treatment plant than to tell it how to raise the funds to pay for the plant. This was one of the observations that Myron Tatlock, of the Ralph L. Woolpert Company, consulting engineers, Dayton, Ohio, expressed in his address before the Federation of Sewage Works Associations' annual meeting in Washington, D. C. Frequently, state-imposed limitations on bonded indebtedness means that sewage-treatment facilities must be built by revenue bonds, and the high construction costs mean high rates with no sure guarantee of payments.

Georgia, Mr. Tatlock stated, can combine water and sewerage charges under a utility board and thereby add to the financial security of the plant. New York State has exempted 75% of the cost of sewage-treatment plants from the debt limitation if the city can show that the project is self-supporting through revenues.

Seven general methods are available, according to an American Public Works Association study, he explained. These are:

UNIFORM RATE—restricted generally to small communities, costs running from $3 to $5 per year.

NUMBER AND TYPES OF SEWER CONNECTIONS—also used by small communities where differences among property are not great. Costs range from $15 to $25 per year.

TYPE OF PROPERTY—requires a wide range of property classifications to be administered fairly. Costs run from $12 to $60 per year.

NUMBER AND TYPE OF PLUMBING FIXTURES—useful where water utility is privately owned. However, it requires frequent, costly inspection.

WATER USE—adaptable for use in metered municipal systems. The metered water is most accurate, but does not take into account benefits to vacant property. Combined water and sewerage simplifies the billing.

METERED WATER AND STRENGTH OF SEWAGE—useful for certain problems involving industrial wastes. Requires agreement as to the strength of the wastes being placed in the sewers. It should take into account the type of treatment afforded.

FIXED PERCENTAGE OF THE WATER BILL—fundamentally a water-use type of financing.

J. C. Bumstead

Ohio Valley Commission Names Assistant Director

APPOINTMENT of John C. Bumstead to the post of Assistant Director of the Ohio River Valley Water Sanitation Commission was announced recently by Henry Ward, chairman of the Commission.

A former lieutenant-colonel in the Army Sanitary Corps, Mr. Bumstead in recent years has specialized in reporting new developments in water treatment and waste disposal for *Engineering News-Record*. As associate editor of that paper, he has written widely on stream-sanitation activities in the eight states that are signatories to the Ohio compact commission.

Prior to his Army experience, Mr. Bumstead was an Assistant Field Engineer of the staff of the Tennessee Valley Authority. From 1935 to 1941, he was Assistant City Engineer of Saratoga Springs, N. Y.

How Much Stream Pollution?

ENOUGH to keep the sanitary-engineering profession pretty busy, according to Mark D. Hollis, Assistant Surgeon General of United States Public Health Service. Speaking before the annual meeting of the Federation of Sewage Works Associations in Washington recently, he pointed out that today there are 20,000 significant sources of pollution, evenly divided between municipal and industrial. The pollution load, discharged by 6,000 of these municipalities, amounts to a population equivalent of 30,000,000 people. These figures do not include some 4,000 municipalities serving 40,000,000 people where data on pollution load are incomplete.

Of 10,000 industries, Mr. Hollis stated, 5,000 discharge organic wastes. About 2,000 of these produce wastes are equivalent to the waste of 40,000,000 people. He stated that no measure of the rest of the organic waste is currently available.

Mr. Hollis estimated that nearly 6,000 new or enlarged sewage-treatment plants are needed by municipalities, and 3,000 industries need new or enlarged plants. Approximately 1,000 municipalities and 5,000 industries have not had their needs appraised, even though these should not be ignored.

From 1915 to the present date, about $9,000,000,000, based on a 1949 price index, has been invested in public sewage-treatment facilities. In addition, about $1,000,000,000 has been spent on maintenance and repair. This outlay does not include charges for interest and operation. During 1949, municipalities spent $277,000,000 to build 208 sewage-treatment plants. In 1946, they constructed 23; in 1947, 93; and in 1948, 167.

Pollution Survival in Sea Water

POLLUTION BACTERIA, as measured by *Eschericha coli* population counts, are unable to survive for extended periods of time in the sea. According to a report appearing in the October issue of the *American Journal of Public Health*, as much as 95% of populations of *E. coli* die off daily in sea water.

The report further notes a seasonal variation in the length of time *E. coli* can survive in sea water. They are less viable in summer than in winter. The report concludes that the most probable cause of the death of *E. coli* populations is an antibiotic action which requires the presence of the normal marine flora. This is interpreted as an important reason for the disappearance of coliform bacteria from tidal waters.

The report represents a study made by the Woods Hole Oceanographic Institutions, Woods Hole, Mass. The study was made by Ralph F. Vaccaro, Margaret P. Briggs, Cornelia L. Carey, and B. H. Ketchum.

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- High-Arch Front Axle for Clearance
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In Houston, Texas — as in hundreds of other cities and towns the country over — Adams Motor Graders are saving time and money on all types of projects . . . building, rebuilding and maintaining city streets and alleys — backfilling over sewers, water mains and gas pipes — leveling playgrounds, parks, parking areas, etc. . . . You'll find in the Adams line a model with the right power and right capacity to meet individual needs exactly. Ask your local Adams dealer for complete information on the machine best suited to your requirements.

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Air-Filled Tractor Tires Outpull Liquid-Filled Tires In Sand and Loam

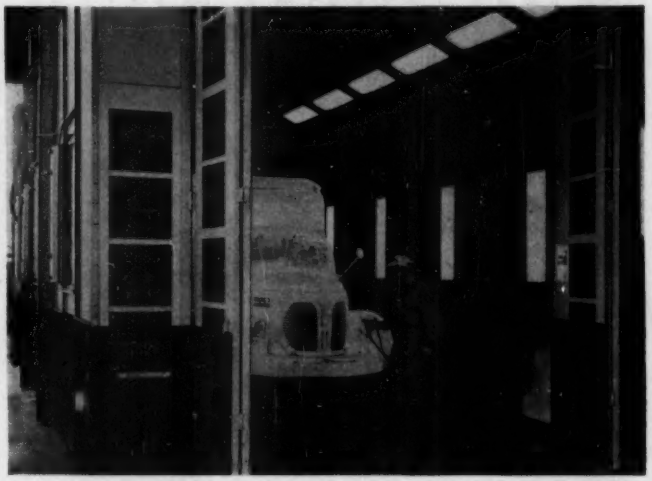
AIR-FILLED and weighted tractor tires can outpull liquid-filled tires in at least two types of Southern soils, according to I. F. Reed, of the U. S. Department of Agriculture, and J. W. Shields, manager of the Farm Tire Division of the U. S. Rubber Company. Both have been working cooperatively on farm-tractor-tire experiments at the USDA Tillage Machinery Laboratory, Auburn, Ala. Their findings were reported at the American Association of Agricultural Engineers' annual meeting which was held in Chicago a short time ago.

Three different methods of weighting tractor-drive wheels were compared in the tests at Auburn. One tire was air-filled, another filled to rim height (79%) with water, and the third was completely filled with water. Weights were added to the 79% liquid-filled and the air-filled tires to bring their weights up to that of the 100% water-filled tire. All tires were identical and were operated under the same loads and conditions.

In both soils, the two experts said, the air-filled tire proved best; the 100% water-filled tire, least efficient. The air-filled tire was superior to both of its competitors in efficiency of travel, force, and power, and also in rolling resistance.

Percentage-wise, the air-filled tire tested in sand showed 3.2% more travel efficiency than the 79% liquid-filled tire; 7% more force efficiency, and 8.6% more power efficiency. It topped the 100% liquid-filled tire in these respective efficiencies by 3.3, 7.2, and 8.9%. The rolling resistance in sand of the air-filled tire was only 210 pounds. For the 79% water-filled, the rolling resistance was 320 pounds, and for the completely water-filled tire, 325 pounds.

In loam, the air-filled tire's advantage wasn't as great, but it still dominated the other two in all phases of the test. In travel efficiency it was 1% more efficient than the 79% liquid-filled tire, and 4.4% more efficient than the 100% liquid-filled tire. It correspondingly was 2% and 4.3% more efficient in force, and 2.4% and 7.1% more efficient in power. Its rolling resistance in loam was 240 pounds; the 79% liquid-filled tire offered 275 pounds of resistance, and the liquid-filled, 320 pounds.



A refuse-collection truck is repainted and refinished in an auto-truck refinishing booth by a street-department worker in Toledo, Ohio. This is part of the program conducted by Toledo's street department in maintaining and cleaning the equipment used in all phases of street-construction, street-cleaning, and refuse-collection work. The refuse trucks are white; all others are yellow.

Toledo's Street Department Solves Truck-Refinishing Problem

WHEN machinery must be used daily to keep a city clean, the municipality's street department is confronted with the problem of maintaining and cleaning the equipment.

In Toledo, Ohio, the city street-department employees use more than 100 trucks and automobiles, and nearly 100 pieces of specialized machinery every day. Russell Bassett, Superintendent of Equipment for the city's street division, reports that distinctive paint used on motor vehicles was soon worn off because of the constant cleaning and washing of the trucks employed to haul dirt, street-repair materials, rubbish, and garbage, and using the same cleaning equipment to sweep streets and grade alleys.

Repainting and Refinishing Program

He solved this problem by supervising a regular repainting and refinishing program for street-department garage workers, and had a DeVilbiss auto-truck-finishing booth installed.

Noting that refinishing of refuse-collection trucks is especially important, Mr. Bassett points out that repainting is necessary to protect the surfaces which are attacked by acids prevalent in rubbish and garbage.

Refuse-collection trucks are painted white, and other street-department equipment, a bright yellow. These colors were selected because of their high degree of visibility, Mr. Bassett reveals, and enable crews to work under all types of weather conditions.

Rubber Avenue

NAUGATUCK, Conn., the site of the factory, which, in 1843, produced the first rubber product under the original patent of Charles Goodyear, has placed rubberized asphalt wearing surface on Rubber Avenue, one of the main streets in the community.

The street was resurfaced with a combination of asphalt and meltable rubber compound developed by the Naugatuck Chemical Division of the United States Rubber Company.

ADEQUATE PROTECTION?

NOT IF AN ALARM BOX IS MORE THAN 500 FT AWAY!
In residential districts it should not be necessary to traverse more than one block, or 500 feet, in order to reach an alarm box. Fire tragedies follow Delayed Alarms.
TRADE MARK
GAMEWELL
REG. U.S. PAT. OFF.
FIRE
FOR
FIRE
PULL DOWN
HOOK

The GAMEWELL COMPANY

NEWTON UPPER FALLS 64, MASSACHUSETTS

IN CANADA: NORTHERN ELECTRIC COMPANY, LTD., BELLEVILLE, ONTARIO

Masks for Fire Fighting Give Greater Efficiency and Safety

MANY fire departments have not been taking full advantage of modern, protective-breathing equipment. Men staggering out or being carried out of a burning building is evidence enough that not only do men suffer, but the fire department loses their services and the services of those attending them at a time when they are most needed. This was recently discussed by the National Board of Fire Underwriters, of New York. Additional companies have to be called to replace them, thus weakening protection for the remainder of the city. Much of this unnecessarily decreased efficiency of fire-fighting operations could be eliminated by the proper use of adequate gas masks or other breathing equipment.

PHOTO COURTESY SCOTT AVIATION CORP., LANCASTER, N. Y.

This is a common type of fire that calls for the proper breathing equipment.

New Types of Gas to Deal With

Due to new processes and materials, firemen are running into many gases not formerly encountered. Wearing a mask a man cannot do as much or work as fast as without one, but it is better that he be able to work at lower efficiency than not at all.

The three types of masks ordinarily used by fire departments are the filter, the self-contained, and the hose or supplied-air types. The self-contained type can be subdivided into three classifications: The self-generating, the demand, and the oxygen rebreathing types.

The most common mask in use is the filter type, frequently known as the "all-service type" or Bureau of Mines Type N. This is a device for filtering toxic gases and smoke but allowing the passage of oxygen and nitrogen to the wearer. Therefore, this mask cannot be worn where the oxygen content of the atmosphere has been reduced, by being replaced with gases or smoke, to below 16%, which is the minimum amount necessary to sustain life.

The filter-type mask, as used by fire departments, gives adequate protection against ammonia in concentrations up to 3% and other poisonous gases up to 2%. The advantages of it are its light weight (6 pounds) and relatively compact design, the ease and speed with which it can be put on, and the length of time it can be used. The canister is good for two hours' continuous or intermittent service, up to one year, after it has been placed in service.

The self-generating mask consists of a canister that automatically generates oxygen; a breathing bag, a face piece, and carrying harness. Because it generates its own oxygen, it is entirely independent of the outside atmosphere and can be worn regardless of how little oxygen is present or how high the concentration of poisonous gases.

The canister for the mask is rated for 45 minutes, but may be used up to one hour under normal exertion. If the canister is once used, however, even for a short time, it must be replaced.

Demand Type of Mask

The demand type consists of a cylinder of compressed air or oxygen, necessary valves, face piece, and carry harness. Like the self-generating type, these can be worn safely under any atmospheric conditions. Exhaled air or oxygen is vented to the surrounding atmosphere through an exhalation valve. Therefore, relatively large cylinders of compressed gas are required for a minimum acceptable operating period, while no breathing bag or chemical remover for carbon dioxide is required. Operating period should be at least 30 minutes. With this type of mask, it is essential that proper means be provided for recharging the cylinder, in some instances even on apparatus.

The oxygen rebreathing type consists of relatively small cylinders of oxygen, necessary regulation valves, a face piece, a breathing bag, and chemicals to remove the carbon dioxide from the exhaled breath. Utilization of oxygen from the exhaled breath permits a longer period of use from a small cylinder.

Each of the above types of masks is of value against smoke and toxic gases but is no protection against fire or heat; if it gets too hot to remain in a building without a mask, it is too hot to stay with one.

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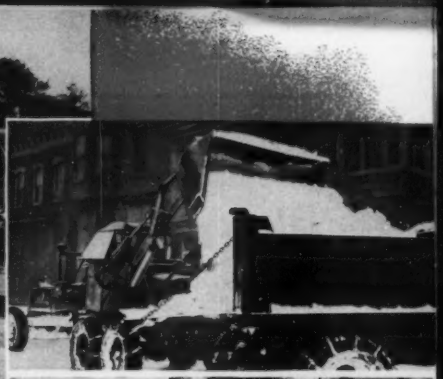
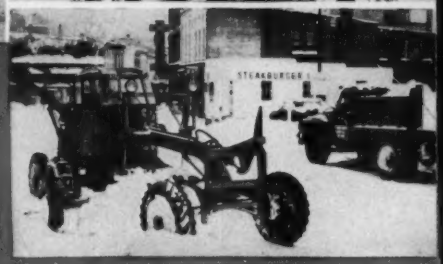




SNOW REMOVED AT THE RATE OF 150 YARDS PER HOUR in Galena's business section. Operation included windrowing snow with grader blade, then loading into trucks with rear-end loader. Parking facilities were quickly restored. V-type snowplow was used on the Model D to open outlying roads.

HOW TO GET *More Mileage* FROM YOUR *Road Maintenance Dollar*

USE THE ALL-AROUND, LOW-COST ALLIS-CHALMERS MODEL D MOTOR GRADER—

ONE WEEK'S GRADING IN ONE DAY. The Model D does more grading in a single day for Galena than the old tractor and towed grader did with two men in one week.

Produces at Both Ends... As Well as in the Middle

One man handles the work of a crew with the low-cost Model D! Does a better grading job with tandem drive and other big grader features . . . and is an all-year, all-around outfit with easily attached accessories.

In Galena, Ill., for example, a Model D with loader, scarifier and snowplow attachments speeded all phases of road maintenance, snow removal and material handling . . . *and decreased manpower requirements for these jobs by more than 40 percent!* That's cutting labor costs almost in half.

Like Galena, you can get more mileage from *your* road maintenance dollar with the versatile Model D. Let your Allis-Chalmers dealer prove it . . . NOW!

WORKS ON STEEP GRADES—WINTER AND SUMMER. Many grades are more than 22 percent in Galena's hilly terrain. Tandem drive and rear-engine design give the Model D ample power and traction to work these steep grades the year around — shaping, ditching, plowing snow.

Some of the Easily Mounted Attachments that Make the Model D the Most Useful, All-Around Grader on the Market Today

REAR-END LOADER. Hydraulically operated, ⅜ cu. yd. bucket . . . available with bucket teeth.

V OR BLADE-TYPE SNOWPLOWS. Interchangeable, hydraulically operated. Blade plow may also be used for backfilling and light 'dozing.

SCARIFIER MOUNTS behind grader blade . . . makes full use of weight and traction . . . steering is much easier.

WINDROW ELIMINATOR. Saves extra passes by feathering out windrows.

Also: All-View cab — easy to remove and replace . . . heavy-duty front tires and other special accessories.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U.S.A.

Street Cleaning and Refuse Disposal

Front-End Loader Adapted to Gutter Cleaning

THE City of Columbus, Nebr. (1950 pop., 8,800), faced with additional miles of post-war paving to clean and a limited amount of equipment, has mechanized its work as much as possible. A Standard Steel Works street flusher flushes all loose dirt and dust to the gutter. This is followed by a Detroit rotary broom mounted on a Ford tractor that knocks loose any hard or compacted debris, thereby moving all the soil to the gutter.

Since the street department has no pick-up sweeper, it had been the practice of the department to remove this material by hand shoveling. However, we have adapted a reinforced Ottawa front-end tractor-loader mounted on an International Harvester I-6 tractor for the work. By welding a flange to the side of a large 1-yard bucket ordinarily used for snow, little or no handwork was needed. One operator and one other man can clean by hand any soil missed by the bucket. The flusher - sweeper - bucket combination can clean gutters at the rate of three to six blocks per hour, depending on the amount of material to be picked up. Two trucks are kept busy hauling the material. In operation the loader dumps the material directly into the truck and the truck operator acts as clean-up man behind the loader. This system has removed as much as 64 cubic yards of material in one 8-hour shift.

BRUCE L. GILMORE
City Engineer
Columbus, Nebr.

Ishpeming, Mich., Sanitary Fill

Ishpeming, Mich., uses the landfill method to dispose of its refuse. A Caterpillar diesel D4 tractor with a Trackson Traxcavator does the work of trenching, compacting, and covering as one of the city's Heil Colecto-Pac trucks delivers the refuse.

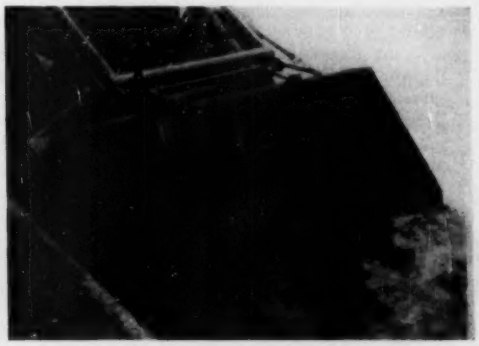
Portable Refuse Containers

WHEN one faces the problem of handling refuse from business premises, blocks of dwellings, schools, hospitals, and similar locations, both United States and British sanitation experts seem in agreement on the use of large portable containers.

British practice was outlined by Hugh Wilson, Director of Public Cleansing, Paddington, England, before that country's recent Public Works and Municipal Services' Congress. Most, however, are smaller than the Dempster Dumpster or Load Lugger types used here. They have three regular sizes: ¾, 1¼, and 2¼ cubic yards, all with folding or sliding lids. One type stands at the premises in a horizontal position. When discharging takes place, it is through a detachable end-plate or door. Two others stand vertically; one has a discharge arrangement by means of a hinged bottom, and the other is emptied by means of a special attachment to the refuse-collector vehicle.

The large containers, Mr. Wilson stated, are definitely preferable to a long row of "dustbins" as the British call the refuse cans. They can also be used to hold street debris, if necessary.

The bucket loader scoops up a load of street dirt.



A close-up of the bucket—note the flared flange.

COSTS ARE LESS

Photo courtesy Allis-Chalmers

...when engines are lubricated with TEXACO URSA OIL X★★

Your heavy-duty gasoline and Diesel engines will run better, perform more work, and last longer when they are lubricated with *Texaco Ursa Oil X★★*. Fully detergent and dispersive, *Texaco Ursa Oil X★★* cleans as it lubricates . . . assures lower maintenance costs.

Texaco Ursa Oil X★★ cuts down fuel consumption because it keeps rings free and valves functioning smoothly. Your engines deliver full power. *Texaco Ursa Oil X★★* stands up under heat and pressure . . . assuring maximum protection against wear and corrosion.

Other Texaco Cost-Savers:

1. *Texaco Marfak* – It seals itself in chassis bearings, seals dirt and moisture out . . . outlasts ordinary greases . . . requires fewer applications.

More than 350 million pounds of Texaco Marfak have been sold.

2. *Texaco Marfak Heavy Duty* – Offers full protection and economy in wheel bearings, requires no seasonal change . . . reduces maintenance costs.

3. *Texaco Track Roll Lubricant* – Assures longer service life for crawler track mechanisms . . . reduces wear.

A Texaco Lubrication Engineer will gladly show you the way to greater savings through Texaco's Simplified Lubrication Plan. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

TEXACO Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

TUNE IN . . . TEXACO presents MILTON BERLE on television every Tuesday night. METROPOLITAN OPERA radio broadcasts every Saturday afternoon.

Obtain this Literature Free of Charge!

Please check over the list of interesting free catalogs on this and following pages. To obtain the literature you want, write directly to the manufacturers at the addresses given. If you prefer, you may circle the identifying numbers on this coupon and mail to THE AMERICAN CITY, *470 Fourth Ave., New York 16, N. Y., and we will see that catalogs are sent to you without expense or obligation.*

2/51

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Name ..... **Position** .....

Address .....

Municipal Plan of Food-Waste Disposal

100 A complete, factual presentation of the Hotpoint Municipal Plan of food-waste disposal written for municipal officials is available at your request. Hotpoint, Inc., 5600 W. Taylor St., Chicago 44, Ill., reports that this method provides a means of eliminating food waste before it becomes garbage. Among the advantages are reduction of flies and rats, lowering of garbage collection cost, elimination of garbage collection problems and odors, and health protection for the people.

Steel Pipe for Large Mains

101 Bethlehem Tar-Enameled water pipe for water mains resists incrustation and corrosion, gives a long life of service, and is simple to install. Formed from heavy steel plate and machine-welded, the pipe is coated and lined with protective coal-tar enamel and single-wrapped with asbestos felt on the outside. When planning your next water main, contact the Bethlehem Steel Co., Bethlehem, Pa., for full details on this product.

Filter Sand And Gravel

102 Filter sand and gravel produced from an inland pit makes them free from river contamination and foreign matter. The manufacturer, the Northern Gravel Co., P. O. Box 307, Muscatine, Iowa, will ship the filter sand and gravel in bulk or bags. Many of the larger filter plants in the country use sand and gravel from this company. For full details, write to the firm.

Microfilmer Protects Business Records

103 The Recordak triplex microfilmer affords complete protection for your vital business records. Documents are recorded with photographic accuracy and completeness on compact film rolls which can be vault-stored. The Recordak automatic feeder inserts hundreds of documents per minute into the microfilmer. Write today for a free copy of *59 Billion Records Can't Be Wrong*, issued by The Recordak Corp., a subsidiary of the Eastman Kodak Co., and located at 444 Madison Ave., New York 22, N. Y.

Street Department Hose

104 A Street Department official is a "chump" if he takes the old leaky hose from the Fire Department for his general work, because Bi-Lateral makes a hose especially for this service the company states. It is a rubber hose, costs more than cotton hose, but is not so expensive because it does not have to be dried; therefore, only the necessary amount need be purchased. Bi-Lateral street and sewer hose coupled with the forged rocker lug coupling will stand almost any abuse required. Write for booklet from the Bi-Lateral Fire Hose Co., 20 N. Wacker Drive, Chicago 6, Ill.

Street Lamps

105 Amplex street lighting lamps are specially designed and built to survive the vibration and shock of road traffic. The Amplex Corp., Dept. K-1, 111 Water St., Brooklyn 1, N. Y., will send full details on request. The concern issues weather-proof bulbs and lamps, as well as sealed-beam reflector lamps, spotlights, and floodlights.

How to Survive an Atom Blast Shown in Documentary Film

106 Do you know what to do should your community be shattered by an atom blast? Along with the advice issued in print comes visual-aid instruction. The Cornell Film Co., 1501 Broadway, New York 18, N. Y., has produced a documentary film that dramatizes personal defense against atomic attack. Filmed with the cooperation of the Army, the Navy, and the American Red Cross, "Pattern of Survival" runs 20 minutes. It shows how to prepare against the A-bomb, to shield yourself and loved ones, and how to know when you are safe. City officials who are anxious to prevent panic in their city should write to the Cornell Film Co., or ask for it from their local film library.

Dredging

107 Engineers of the Morris Machine Works, Baldwinsville, N. Y., will help you solve your problem, whether it be cleaning out water reservoirs, deepening lakes or channels, restoring eroded beaches, filling in undesirable lowlands, or beautifying parks and lakes. Write for full details about Morris dredges, asking for *Bulletin 177*.

Wetter Water For Fighting Fires

108 Wetting agents for aiding fire extinguishment are well out of the experimental stage, and fire departments are settling on those they find most effective. A favorite is Unox for its penetration and spread, abating smoke, and cutting down on water needed. Unox penetrant is made by the Carbide and Carbon Chemicals Division of the Union Carbide and Carbon Corp., 30 E. 42nd St., New York, N. Y.

This Pipe Withstands Severe Service Conditions

109 The structural strength and material durability of Armco Asbestos-Bonded pipe is stressed in the six-page folder issued by the Armco Drainage and Metal Products, Inc., 2260 Curtis St., Middletown, Ohio. Construction of the pipe, test installations, and economy of operation through elimination of costly replacements are also discussed. A copy of the folder can be had on request to Armco Products, Inc.

Lower Your Street Costs With These Asphalt Plants

110 Don't let runaway costs throw your street maintenance budget out of gear. Look into these money-saving Standard Steel Corp.'s asphalt plants that will provide you low-cost, high quality street surfacing material. These rugged plants are built in seven sizes to fit your needs. Write to the Standard Steel Co., 5085 Boyle Ave., Los Angeles 58, Calif., for full details.

Compound Meters

111 The Hersey Mfg. Co. of South Boston, Mass., produces its compound meter which comes in models with all-bronze cases of two to six inches. The company features the fact that its equipment is your best guarantee of accurate and dependable service at low maintenance cost.

Booklets Issued On Prestressed Pipe

112 Three booklets on prestressed pipe are issued by the Price Brothers Co., 1766 E. Monument Ave., Dayton 1, Ohio. These are: *Manufacturing and Prestressing; Tapping Under Pressure*; and *AWWA Specification No. 7B,2-T*. Three materials used in manufacturing prestressed concrete steel-cylinder pipe are sheet steel, high tensile steel wire, and concrete. The firm, without charge, will supply its engineers for consultation on pipeline design and laying problems, and will send its booklets on request.

Eye-Catching Fluorescent Colors

113 *Fluorescence, the New Dimension in Color* is the title of an attractive bulletin issued by Lawter Chemicals, Inc., 3550 Touhy Ave., Chicago 45, Ill., available to you on written request. The Lawter line includes "Day-Glo" daylight fluorescent for advertising; phosphorescent luminous paints, printing ink resins, fluorescent paints for use with black light, black-light fixtures, paints for instrument panels. All Lawter products have weathering characteristics and color stability.

Atomic Bomb Shelters

114 Timely and vital information for state and local civil defense officials will be provided by the Atomic Shelter Institute, 10 Park Ave., New York 16, N. Y. The company offers complete designs and surveys for atomic bomb shelters. The firm's material is based largely on official data prepared by the U. S. Dept. of Defense and the U. S. Atomic Energy Commission. Areas are investigated and charted by the Institute which assembles data on designs of shelters, location, cost, amount of protection, access, and other related data.

(Please Turn to Page 24 for More Literature)

Which Catalogs Interest You?

Write directly to the manufacturers, or use the coupon on page 23

Simplified Water Meters

115 The Buffalo Meter Co., 2902 Main St., Buffalo 14, N. Y., announces that its meters have fewer parts and more simple castings. These meters are noted for quality and accuracy and the initial cost is moderate, because of the simple over-all design.

Has Your City Been Surveyed from the Air?

116 City maps for all purposes can be obtained most quickly and with least confusion in your department by ordering just the maps you want "made by air." They cost least and have engineering accuracy. The Aero Service Corp., 236 E. Courtland St., Philadelphia 20, Pa., places a staff of 200 mapping specialists back of your requirements. Whether your problem is: where can industry expand?, growing residential population, traffic and transportation study, extension of mains, sewers, electric service, fire-alarm boxes, or property reassessment, write Aero Service.

Warning Lanterns

117 Embury Traffic-Gard lanterns burn 100 hours on a pint of kerosene, are coal burning, and have no lens breakage from heat. The Embury Mfg. Co., producer of this equipment, reports that Embury warning lanterns are low in first cost and maintenance, and simple to carry and place. Full details may be obtained by writing to the Embury Mfg. Co., 230 Allen St., Warsaw, N. Y.

Aerial Ladders For Rescue Work

118 When lives and property in your community are endangered, use aerial ladders. Peter Pirsch & Sons, Co., Kenosha, Wis., manufactures ladders which are noted for their strength, speed, and dependable performance. Full details will be sent by the firm.

Pipe Cleaning Tools

119 The Flexible Underground Pipe Cleaning Co., 9059 Venice Blvd., Los Angeles 34, Calif., will send complete details about its pipe cleaning tools. The company announces that its equipment can be used for any size of sewer line and for all sizes of water line.

Buy Punched Card Machines At Less Than Rental Cost

120 Punched-card or tabulating machines are increasingly used by municipalities for both accounting and statistical operations. By a monthly payment plan costing less than the usual rental fee, a municipality may acquire ownership of the machines after a given period of use. Write for the folder, *Everything to Gain, Nothing to Lose*, available from Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y.

Both Sides Mimeographed

121 Paper requirements are cut in two when you use A. B. Dick's Modern mimeographing, for both sides are used. Other features include duplicating in four or more colors at once, and mimeographing on almost every kind of paper and card stock. For a free portfolio of Modern mimeographing samples, write the A. B. Dick Co., Dept. AC-1250, 5700 W. Touhy Ave., Chicago 31, Ill.

New Truck Loader For Street Maintenance

122 An answer to the problem of increasing costs on street maintenance jobs is the new Holmes-Owen truck loader, reports the manufacturer, the Ernest Holmes Co., Chattanooga, Tenn., who points out that the driver can load, haul, dump, and do light digging, and grading. For further information on this self-loader with elbow action, write the company.

Booklet Discusses Aeration Sewage Plants

123 *Contact Aeration Sewage Plants* is the title of the illustrated booklet issued by the Refinite Sales Co., Refinite Bldg., Omaha, Neb. Divided into three sections, the publication deals with contact aeration principle, presents a study of prefabricated versus special plants, and discusses typical installations. Chemical analysis of composite samples in these installations is included. Write the Refinite Co. for your free copy.

Expansion Joints

124 The Dresser Mfg. Div., 59 Fisher Ave., Bradford, Pa., issues a new four-page leaflet describing the four principal types of expansion that it produces. Ranging in size from three-inch ID to 24-inch OD, the four principal types are a single-end, double-end, single-end with limited movement, and double-end with limited movement. The firm reports that larger sizes can be furnished upon request. Write for your copy of the new leaflet.

Self-Propelling Machine For Cleaning Sewers

125 The Sewer Scooter is a self-propelled machine for 6- to 96-inch sewers. It removes, sand, gravel, rocks, bricks, mud, grease, broken rods, and metal. All the work is done from street level and the device reduces cleaning time by 75% to 80%, reports the concern. For printed matter on this machine, write to the Fitzgerald Engineering Co., Inc., P. O. Box 289-G, Coral Gables 34, Fla.

Sprayers for Pest Control

126 The A. B. Farquhar Co., 3536 Duke St., York, Pa., produces the Iron Age mist sprayer for use on golf courses, park, playgrounds, swimming pools, tourist courts, and other places where insect pests are a problem. Model 125 has a 22-hp, four-cylinder Wisconsin engine and delivers 600 to 11,000 cubic feet of air per minute. The turret rotates 360 degrees for full control of air blast. Full details on this method of pest control can be obtained directly from A. B. Farquhar.

Have Leaf Problems?

127 The Vacuum Leaf Loader is the answer to every community's annual problem — removing leaves from the streets. This two-wheeled trailer construction is easy to install, saves labor, time and cost and insures flexibility. The Loader proves its versatility, since it can also be used for many other operations, such as sand blasting, ventilating sewers and tree spraying. For illustrated bulletin, write to M. A. Elliotte, P. O. Box 64, Grafton, N. Y.

Flexible Sewer Pipe Joints

128 There are two types of Tylox rubber gaskets for pipe coupling: Type A, for use with head pressure up to 50 feet, is a tight, durable, and flexible joint. Simplicity of design makes for low cost per laid foot; Type B gaskets, for head pressure up to 75 feet, are cast into bell or socket at pipe plant. Economical and easy to install, Tylox joints eliminate infiltration, and are permanent, durable, and rootproof. Further information can be had by writing The Hamilton Kent Mfg. Co., Kent, Ohio.

Need a Speedy Trencher?

129 A new catalog describing the improved Model 221 Trenchliner is available on request from the Parsons Co. Box 431, Newton, Iowa, subsidiary of the Koehring Co., Milwaukee, Wis. The versatile 221 digs in 12 variable cutting widths, has arch-type frame, and an arc-type discharge conveyor. It cuts through anything short of solid rock, and features a selection of 15 digging speeds.

Automatic Valves

130 Automatic valves, produced by the Ross Valve Mfg. Co., Inc., P. O. Box 596, Troy, N. Y., include the altitude valves for control of elevation and heads into and out of tanks, basins, and reservoirs, and combination valves which permit flow in one or both directions Full details will be sent you on request.

Three Yards a Minute Loaded by This Tractor

131 Caterpillar of Peoria, Ill., manufacturer of diesel engines, tractors, motor graders, and earth-moving equipment, reports that its D-4 tractor with T-4 Traxcavator can handle up to three yards of material per minute for sanding slippery streets in winter and, after a snowfall, load six to eight six-yard trucks as fast as the snow can be hauled away.

City Tax Equalization

132 The J. M. Cleminshaw Co., Union Commerce Bldg., Cleveland, Ohio, will send on request its illustrated brochure describing its public appraisal service. The firm's employees are specialists in the revaluation of real estate, personal property, and public utilities for local tax equalization purposes.

Water, Sewage, Waste Treatment Equipment

133 The complete line of water, sewage, and industrial waste treatment equipment of the Jeffrey Mfg. Co., 970 N. 4th St., Columbus 16, Ohio, is described and illustrated in its new 50-page booklet featuring details on a wide range of machinery. These include screens and screening grinders, grit and sludge collectors, scum removers, conveyors, and Jeffrey "Floctrol" flocculation controllers. Diagrams, tables, and photographs of typical installations are included. Write for your free copy.

Handy Loaders

134 The Lull Shoveloaders for municipal use work every day of the year loading broken concrete curbing, ripping pavement, digging and loading dirt, removing snow, and performing many other jobs. The Lull Mfg. Co., 3612 E. 4th St., Milwaukee 6, Minn., will send illustrated literature on its Shoveloader and attachments

Need Assistance in Steel Selection?

135 An informative leaflet, *Guide to Steel Selection*, is a real boon to those in need of guidance with steel problems. The leaflet lists all popular grades of hot-rolled and cold-finished carbon and alloy steel bars, gives principal characteristics, mechanical properties, and uses of each. For a free copy, write Joseph T. Ryerson & Son, Inc., 2558 W. 16th St., Chicago 80, Ill.

Mechanized Central Payroll

136 The Underwood Sundstrand payroll machine automatically calculates net pay. Only ten numeral keys are used for touch operation. This machine places the gross pay and payroll deductions on the official payroll, check stubs, and on the individual employee earning cards. Full information will be provided by the Underwood Corp., One Park Ave., New York 16, N. Y.

Water Works Stops And Service Equipment

137 Among the devices described in literature available from A. Y. McDonald Mfg. Co., Dubuque, Iowa, is the E-4723 solid brass tee handle curb stop designed for copper service pipe. This is also available in stop and drain models; sizes are ½, ¾, 1, 1¼, 1½, and 2 inches.

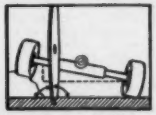
(See Page 26 for More Bulletins)

SAW CONCRETE OR ASPHALT WITH AMAZING

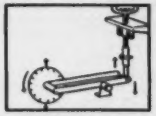
Clipper® CONCRETE SAWS

Saw 12 feet per minute in Asphalt or 5 feet per minute, 1 inch deep, in cured limestone Concrete. With Clipper you can saw up to 6½ inches deep. Concrete Sawing is Practical and Profitable because Clipper Concrete Saws are Built with the experience of World's Largest Manufacturer of Masonry Saws.

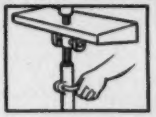
Experience Proves A Concrete Saw Must Have These Clipper Features:



1. Clipper "No Bind" Floating Three Point Suspension Automatically protects blade.



2. Positive Screw Feed Instant control raises or lowers blade smooth, easy.



3. Adjustable Depth Lock Set this handy stop for whatever depth desired.

4. Patented Spray Control Its value is measured in increased Blade Life.

4 wheel — Perfect Control, tips back and turns on a dime.

THREE ENTIRELY NEW MODELS

FAST — EFFICIENT — ECONOMICAL

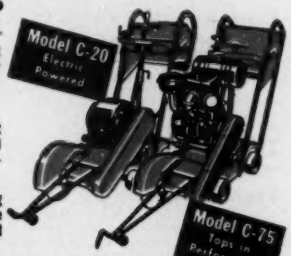
Clipper Concrete Saws ***CUT*** through the toughest concrete, wherever patches, trenches, openings or contraction joints are needed.

SAW BEFORE YOU BREAK...

Eliminate radial cracks. Stop spalling. Have perfect jobs. Architects, Consulting Engineers, City and State Engineers are solving their problems by specifying "Saw before Breaking"

Utility Companies enjoy lower costs while improving Public Relations. Concrete Contractors praise the ease of getting the tough job done with new found profits!

Patent Numbers 2238218, 2455113, 2499984—Other Patents Pending—Printed in U.S.A.



GENUINE CLIPPER DIAMOND BLADES

Regardless of the Material you plan to Cut...Limestone, Flint, Gravel, Aggregate Concrete Green or Well Cured, or Asphalt . . . there's a Clipper Diamond Blade to cut fast and economically.

TRENCH Gas, Water, Sewer, Electric, Telephone, new installations or old ones repaired

CONTRACTION JOINTS Highways, Streets, or Building Floors precision cuts eliminate hand tooling

POLES Installing new City lights? Clipper Concrete Saws prevent radial cracks

DRIVES—WALKS Prove the job can be small and still make concrete sawing profitable

PATCH Saw clean straight lines, break smooth — Size and shape make no difference

Serving the World as the World's Largest Manufacturer of Masonry Saws

YOU CAN'T BEAT A CLIPPER

Here's the guarantee that has gone with every Clipper for more than 12 years to Prove it!

"Guaranteed to Provide Faster Cuts, with Lower Cost, with Greater Ease Anytime, Anyplace"

DON'T DELAY—WRITE TODAY

Completely descriptive literature tells the value of Clipper Concrete Saws. Get this information now! Tell us what you plan to cut!

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Write directly to the manufacturers, or use the coupon on page 23

This Machines Completes 3 Times as Many Sewer Jobs

138 The Bantam clamshell on rubber tires, a product of Schield Bantam Co., 234 Park St., Waverly, Iowa, completes three to four sewage repair jobs a day, including breaking through 20- to 30-inch pavement and digging down 10 to 12 inches to make the repair. The machine is also employed for stockpiling and loading sand, cinders, and aggregate. It has a ⅝-yard capacity with a ½-yard rehandling bucket, a 1-½yard snow bucket and can be mounted on a new or used tandem axle truck. For full details, write to Schield Bantam.

For Pavement Sweeping

139 Is your community faced with street-sweeping problems? If so, contact The Conveyor Co., 3260 E. Slauson Ave., Los Angeles 58, Calif., which will send a catalog describing its Mobil-Sweeper. This machine, with its 2 2/3-cubic-yard dirt hopper, has a full-floating, self-aligning rear broom. Standard equipment includes four-wheel hydraulic brakes, steel-top cab, and shatter-proof windshield. Available are dual control, two gutter-broom sweepers, and the conventional sweeper to aid you with your plans for sweeping regular streets, freeways, or airports.

Expanding Root Cutter And Sewer Cleaner

140 The Expanding Sewer Machine Co., 108 E. Walnut St., Nappanee, Ind., makes a cleaner that will clean the entire sewer wall—top, sides, and bottom, cutting and removing the roots and caked sediment. It is adjusted in 30 seconds to fit any sewer from eight to 30 inches. The firm's new catalog on complete sewer cleaning equipment will be sent on request.

Engines, Power Units

141 Two new folders are available from the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., one describing its line of diesels, the other covering engines and power units. Request your copies of these folders and find the engine or power unit best suited to your needs.

Mercury Lamps For Street Illumination

142 Holophane Refractor-equipped luminaires used on horizontal-burning mercury lamps provide economical and enduring street illumination, according to the manufacturer, the Holophane Co., Inc., Newark, Ohio. The Refractor produces vertical distribution to minimize glare. Refractor-equipped luminaires can also be used with incandescent lamps up to 15,000 lumens. For complete information on the Refractors for all sizes of lamps, with all types of distribution and for all street and traffic requirements, write to the Holophane Co.'s Street Lighting Dept. in Newark, Ohio.

Water Tapping Machine

143 The new Hays Model B tapping machine, product of the Hays Mfg. Co., Erie, Pa., is designed for the man in the ditch and is employed for inserting all standard makes of corporation stops. The head turns freely at all pressures, two ratchet wrenches speed operations, and less time is required to make a tap. The machine is fully loaded and ready for operation before placing on the main.

Trailer and Striping Machine

144 Wald Industries, Inc., Montgomery, Pa., on request will send *Bulletin 506* about its new Carry-Liner trailer which transports larger-type striping machines, such as the Wald Reflecto Liner Model 12, Traffic Liner, and Kelly Creswell striper B3P and B3. The firm also issues *Bulletin 507* on its new Reflecto Liner Model 12 which it claims is the only striping machine designed specifically for reflective marking materials, handling with a maximum efficiency. This model introduced the high capacity Nu-Matic spray gun which lays clean, sharply defined lines.

Need Salt for Ice Control?

145 The Cayuga Industrial Salt Service, Groton, N. Y., offers free descriptive information concerning its salt service in modern street work. Advantages include prompt, direct delivery; specially designed trailer-truck unloading at desired points; technical assistance in salt application; and availability of dissolving equipment and salt spreaders. Write the company for details.

Broom-Sweeper, Flusher For Street Maintenance

146 The Standard Steel Works, N. Kansas City, Mo., will send illustrated literature on its steel constructed broom maintenance sweeper and its power stream street flusher. The sweeper has a sprinkler attachment and is available for traction or power-driven units. Models 8-F and 8-R power stream flushers are equipped with a six-cylinder KXC-5 Hercules water-cooled engine that develops 54 hp at 1,800 rpm.

Wellpoint Systems

147 *Complete Wellpoint Systems*, an illustrated and diagrammed booklet describing the method and advantages of the wellpoint system, is available from the Complete Machinery and Equipment Co., Inc., 36-40 11th St., Long Island City, N. Y., originators of the fluted-tube wellpoint. Listed among the claims for the wellpoint method are wellpoint lightness, adaptability of sizes and lengths, rapidity of header-coupling assembly, elimination of necessity for drainage equipment, flexibility, and dependability in operation. Write the Complete Machinery and Equipment Co. for your free copy of the booklet.

Centrifugal Pump Guide

148 Economical pumping units for every industry are catalogued in a 16-page *Handy Guide to Selection of Centrifugal Pumps*, issued by the Allis-Chalmers Mfg. Co. The wide variety of units include close-coupled, pedestal, single and multi-stage, self-priming, mixed-flow and many other pumps. Tables and charts list head capacities, sizes, construction features. Your copy is free; write Allis-Chalmers Mfg. Co., 1185 S. 70th St., Milwaukee, Wis.

Evacuation Buckets

149 Haiss Clamshell Buckets for excavating and rehandling are constructed with a heavy-duty head frame, wedge-lock dead ending, sta-in-line variable reeving, heavy section connecting arms and center shaft and bearings. A product of George Haiss Mfg. Co., 141st St. and Park Ave., New York 51, N. Y., the buckets are employed for digging and excavating, water, gasoline, electric-line trenching and rehandling. Write the firm for full details.

Adjustable Valve Boxes

150 Designed for modern-day street traffic is the three-piece screw type valve box with 5¼-inch shaft, a product of the Buffalo Pipe and Foundry Corp., Box 55, Station B, Buffalo 7, N. Y. The firm also issues a two-piece, extra-heavy sliding-type adjustable valve box with a 5¼-inch shaft which is used by water departments. For information about these valve boxes and extension service boxes, available in 2½-inch and 3-inch shaft extensions, write for circular.

Pneumatic Water-Works Gauges Bulletin

151 *Pneumatic Water-Works Gauges*, a new bulletin, will be sent by Builders-Providence, Inc., 358 Harris Ave., Providence 1, R. I. The pamphlet, No. 285-G1, discusses the features, description, and operation of pneumatic units, as well as the application of the devices to the summation of several flows.

Make Water Line Repairs With This Crane

152 By using the Hydrocrane you can repair water leaks three times faster than by other methods, declares the Bucyrus-Erie Hydrocrane Div., S. Milwaukee, Wis. Loading directly from ditch to truck, this machine has a hydraulic clamshell bucket, a crane hook, catch-basin cleaning bucket, grapple, magnet, and trash bucket. It can also be employed for digging manholes, meter pits and ditches, loading, unloading and setting pipe, and handling fittings. For full details on this Hydrocrane, available in two sizes—¼ yard, two-ton and ⅝ yard, three-ton, write to Bucyrus-Erie.

Improved Geiger Counter

153 The Detectron Co., 5637 Cahuenga Blvd., N. Hollywood, Calif., announces that its new, improved DG-2 Geiger counter eliminates expensive batteries, and has a three-way signal system. This machine is sensitive to all radioactive minerals, is waterproofed, and can be employed by anyone. The firm also issues the Detectron 505 pipe detector which features an aluminum case, shielded loops, and unit construction. This instrument determines the exact location and depth of hidden pipes, valves, services, stubs, manhole covers, and other metallic objects. Full details on both products will be sent by the company.

Asphalt Street Heater-Planer

154 Of electrically welded construction, the Clarkmoore heater-planer has a fuel-oil burner which throws a flat or horizontal flame into the heating hood, eliminating the detrimental "blow torch" effect. The cutting edge of the blade is especially heat-treated and clamped in position by a reinforcing plate. Range includes five gear speeds and one reverse. For further information, write the Asphalt Maintenance Co., 41 Park Row, New York 7, N. Y.

Small Gasoline Engines

155 Briggs and Stratton single-cylinder four-cycle, air-cooled engines are employed for the home, farm, and industrial equipment. The company reports that 5,000,000 of these small engines are in successful use. Full details will be sent by the Briggs and Stratton Corp., Milwaukee 1, Wis.

Fire Hydrants Have Mechanical Joints

156 The line of M & H Standard compression-type fire hydrants is now available with standardized mechanical joint and connection for use with cast-iron pipe. The M & H Valve and Fittings Co., Anniston, Ala., on request will send its new circular No. 49, which shows installation dimensions of M & H AWWA mechanical-joint hydrants and valves. The firm claims its mechanical joint provides faster and easier installation, cuts construction costs, and reduces joint deflection.

Surge Relief Valve

157 Detailed sectional diagrams of its cushioned surge relief valve are featured in the new eight-page bulletin of the Golden-Anderson Valve Specialty Co., 2093 Keenan Bldg., Pittsburgh 22, Pa., which also lists parts, materials and dimensions, and detailed description of valve adjustment, servicing, and operation. Your copy of the bulletin can be had by writing the Golden-Anderson Co.

Food Waste Disposer

158 If you're interested in abolishing the garbage nuisance, the Mullins Mfg. Co., of Warren, Ohio, will send you details on its Youngstown Kitchen Food Waste Disposer. The firm says that three features of the machine are its continuous feed, self-cleaning ability and long life.

(Please Turn to Page 30 for More Literature)

Here is a 5-gang unit in mowing position. Hydraulic control is available for 3 and 5-gang Worthington Fairway or Grass Blitzer mowers.

FAST WHEN YOU MOW

FAST ON THE GO

Ample ground clearance of cutting units in travel position makes it easy to climb curbs, protecting the cutting units.

WORTHINGTON GANG MOWERS WITH Hydro-Travel CONTROL

High-speed lawn mowing plus fast between-job travel — that's the combination you get with Worthington hydraulically controlled gang mowers.

Mounted on the front-drive Model F Chief Tractor, these smooth cutting mowers save time and money on any large-scale mowing jobs—parks, colleges, institutions, athletic fields, highway shoulders, etc. Mowers are raised and lowered smoothly, easily through a simple, positive hydraulic system controlled from the driver's seat. During travel mowers are held firmly in place for safety on rough roads.

Here's How You Save Time—Cut Costs with Hydro-Travel Control

1. **Fast hydraulic lift eliminates regrouping mowers by hand when crossing narrow bridges and traveling through woods, saving countless hours of labor over the mowing season.**
2. **With gangs off the ground during travel, cutting units are free from damaging effects of rough roads, stones, ruts, twigs . . . reducing maintenance costs.**
3. **Easy storage. Tractor can be driven into a narrow garage or shed without removing mowers—is ready immediately when work is resumed.**

Get the full story on these fast-working gang mowers with Hydro-Travel Control. See your Worthington dealer or write us.

WORTHINGTON
MOWER COMPANY
Stroudsburg, Pennsylvania

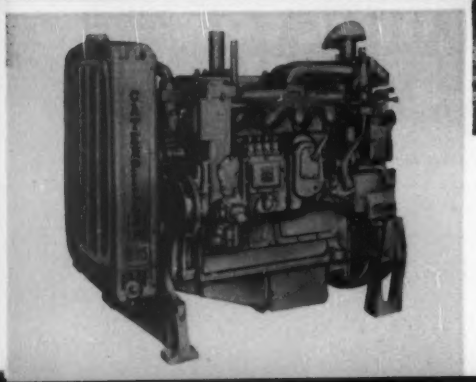
Gentlemen:
Send me complete details on Worthington Gang Mowers and Tractors.

Name .....

Address .....

City ..... State .....

PORTABLE BREAKER WITH DEPENDABLE POWER



ST. PAUL, MINNESOTA — *the sturdy, compact "Cat" D315 Engine shown here powers the above-pictured Portable Breaker working on city streets in St. Paul.*

WORK engine for a work job—the D315 "Caterpillar" Diesel Engine powers the new Athey Portable Breaker. The breaker works with the Athey Forced Feed Loader. Old scarified-and-windrowed road surface material is picked up by the loader—then fed to the crusher and returned to the road. The crushed material is of uniform size and is a very compactable aggregate. The "Caterpillar"-powered Athey Portable Breaker offers governmental users an effective method of conserving materials—and of stretching the tax dollar.

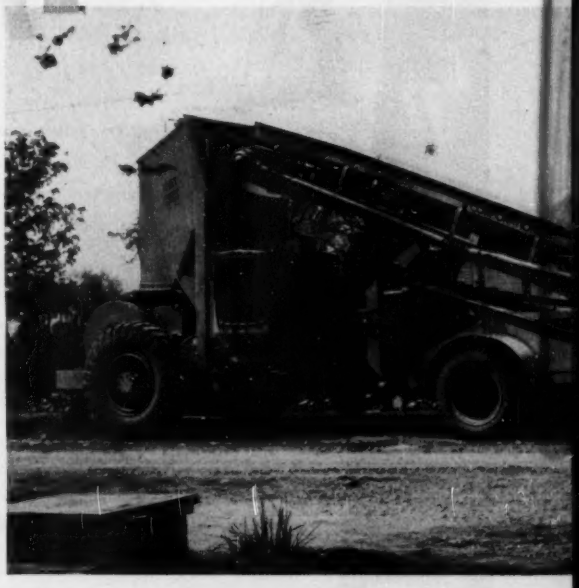
"Caterpillar" Diesels cut their teeth on the tough, rugged jobs. They are designed to withstand the shocks and stress of construction duty. Their working parts are thoroughly sealed against the entrance of abrasive dust and grit.

Your "Caterpillar" dealer distributes Athey equipment. Let him show you what the Portable Breaker can do on your jobs. Let him show you why the leading manufacturers use "Cat" Diesels in the shovels, crushers, compressors, and other powered equipment they build.

Today the importance of "Caterpillar" products, both for military use and for maintaining the national economy, is greatly increased. Talk over your machinery requirements with your "Caterpillar" dealer. He has ample parts stocks to keep your present equipment doing its job and will do his utmost to make prompt delivery of new machines.

CATERPILLAR, PEORIA, ILLINOIS

PIERCE COUNTY, WASHINGTON—*this Athey Portable Breaker is "reconditioning" old surfacing material. The D315 powers the breaker.*



LOOK UNDER THE HIDE

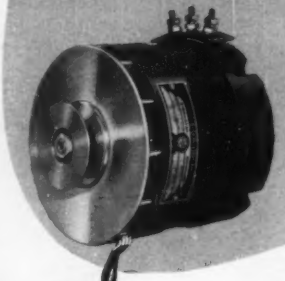
"Caterpillar" fuel lines are made of cold-drawn seamless steel tubing. All lines are the same length to give identical spray characteristics at each cylinder. Able to withstand pressures of 3,000 to 5,000 lbs. per sq. in., the metal is hard yet capable of being cold formed without excessive spring-back. The bore is free of injurious cracks and seams and has uniform diameter. Look under the hide for built-in quality.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT

Dependable Power For DISASTER COMMUNICATIONS SERVICE



Leece-Neville Alternator System Saves Maintenance, Materials and Manpower

A Leece-Neville AC-DC Alternator System delivers 25 to 35 amperes with the engine idling. This effects substantial gasoline savings and reduces engine wear. Current is delivered at a constant, fixed voltage, which lessens deterioration of scarce radio tubes and batteries.

Most important of all is the famous dependabilty of the Alternator System. To help insure vital communications in case of disaster, every mobile radio should be equipped with the Leece-Neville Alternator System.

For all the facts, write Dept 14,
The Leece-Neville Co., Cleveland 14, O.
Pioneer and STILL Quality Leader

Leece-Neville

Catalogs for You

Write directly to the manufacturers, or use coupon on Page 23

Fire Hydrants Provide Community Protection

159 Bulletin 105, issued by The Kennedy Valve Mfg. Co., Elmira, N. Y., describes the Kennedy Safetop fire hydrant with its patented breakable section. This device, the firm reports, is the original safety breakable hydrant and the only hydrant with the threaded breaking ring which holds the two standpipe sections in rigid alignment, providing a positive and inflexible connection. Further information is contained in this bulletin which you may obtain from the company.

All-Purpose Loader

160 Nelson's new loader, the all-purpose Load-all, is the only machine that loads snow, sand, gravel, coal, humus, cinders, leaves, and salt without changes or special attachments, according to the manufacturer, N. P. Nelson Iron Works, Inc., 820 Bloomfield Ave., Clifton, N. J. For further information, write to the company.

Trench Roller Simplifies Street Widening

161 If your municipality is in need of wider streets, The Buffalo-Springfield Roller Co. will send *Catalog S-53-48* which can help. The firm's TR3-B trench roller, described in the catalog, has a 16-inch wide compression roll, well adapted to the compaction of widened sections. The weight of the roll can be increased to produce compressions in excess of 325 pounds per inch of roll-face width. For copy of the catalog, write to The Buffalo-Springfield Roller Co., Dept. H-1, Springfield, Ohio.

Elevated Water Tanks

162 Elevated steel tanks, manufactured by the Pittsburgh-Des Moines Steel Co., 3412 Neville Island, Pittsburgh, Pa., are used for all municipal water-storage requirements. They are supplied in a wide range of designs in capacities up to 2,500,000 gallons. For a copy of *Elevated Steel Tank Brochure*, write to the company.

Hand-Chased Bronze Tablets

163 Meierjohan-Wengler, metal craftsmen, 1102 W. 9th St., Cincinnati 3, Ohio, produce hand-chased genuine bronze tablets for use as memorials, honor rolls, portrait tablets, and markers. The firm also manufactures non-ferrous castings, wrought-iron and bronze grilles, railings, and other ornamental fittings. Write for free catalog.

Steel Curb and Gutter Forms

164 Blaw-Knox curb-and-gutter forms save expensive lumber and carpentry labor and complete each job faster, according to the Blaw-Knox Div. of the Blaw-Knox Co., 2009 Farmers Bank Bldg., Pittsburgh 22, Pa. The forms can be used for simple, straight work, or curved shapes. Write for Bulletin 2259 which describes form set-ups for every type of work with complete instructions on how to use them.

Pumping Problems?

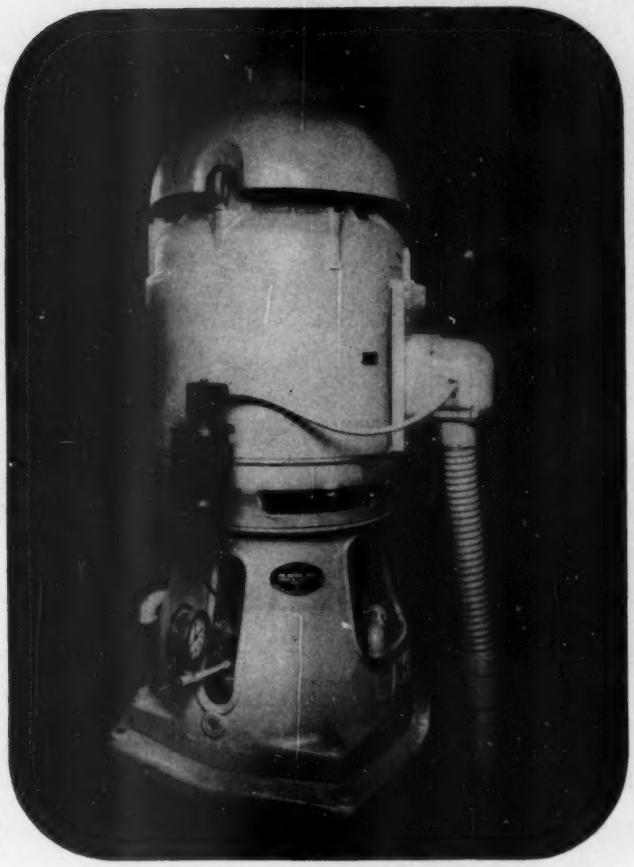
165 Layne & Bowler, Inc., Memphis 8, Tenn., has a new 16-page bulletin, *Short Coupled Service Pumps*. This bulletin covers its complete line of vertical turbine close-coupled pumps and pump heads, including river, re-lift, circulating and general-purpose pumps. Layne & Bowler pumps, the firm says, give efficient service, and have high-quality castings, enclosed impellers, and sleeve-type bearings. A copy of this bulletin may be obtained from the company.

Utility Hoist

166 The Unit utility hoist is fast, easy, and safe to operate, according to the Unit Mfg. Co., Dept. C, 1229 Harmon Place, Minneapolis 3, Minn. Hydraulically operated for shop or truck, the hoist is lifted from a three-wheel frame, placed in socket, or well mounted on truck bed, work bench, loading dock, or machine tool.

(See Page 34 for More Bulletins)

Every Inch
BUILT FOR DURABILITY



LAYNE OFFERS a wide range of fully illustrated catalogs and folders describing Layne Well Water Systems, Oil and Water Lubricated Vertical Turbine Pumps, Short Coupled Service Pumps, Cemented Water Wells, Irrigation Pumps, etc. Sent without obligation.

ALL Layne Well Water Systems are designed and built to give many years of durability,—and that durability extends into every part from motor base to well screen. Once installed according to Layne's own exclusive methods, these ground water supply systems have a record for giving extraordinary satisfaction over extremely long periods of time. This means that as an investment, Layne Well Water Systems always more than justify their cost.

Layne knows that without durability, all of their fine designing and high efficiency features would be lost. As the world's most widely experienced builder of ground water supply equipment, Layne knows what it takes to create durability.

Layne designs and builds complete well water systems, drills the wells and installs pumps to produce ground water for any purpose, — cities, factories, processing plants, etc. No charge is made for their study and recommendations.

For further information, catalogs, etc., address

LAYNE & BOWLER, INC.
General Offices Memphis 8, Tenn.

Layne

WELL WATER SYSTEMS

VERTICAL *Turbine* PUMPS

LAYNE ASSOCIATED COMPANIES

ASSOCIATED COMPANIES—Layne-Arkansas Co., Stuttgart, Ark. ★ Layne-Atlantic Co., Norfolk, Va. ★ Layne-Central Co., Memphis, Tenn. ★ Layne-Northern Co., Mishawaka, Ind. ★ Layne-Louisiana Co., Lake Charles, La. ★ Louisiana Well Co., Monroe, La. ★ Layne-New York Co., New York City ★ Layne-Northwest Co., Milwaukee, Wis. ★ Layne-Ohio Co., Columbus, Ohio ★ Layne-Pacific, Inc., Seattle, Wash. ★ The Layne-Texas Co., Ltd., Houston, Tex. ★ Layne-Western Co., Kansas City, Mo. ★ Layne-Minnesota Co., Minneapolis, Minn. ★ International Water Corp., Pittsburgh, Pa. ★ International Water Supply, Ltd., London, Ont. ★ Layne-Hispano Americana, S.A., Mexico, D. F. ★ General Filter Company, Ames, Iowa.

LE ROI

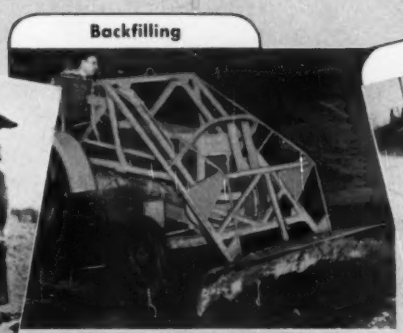
Le Roi gives you more for your MONEY!

more versatility
more profits

Combination bucket and crane boom. Crane boom folds back out of way when not in use. Bucket holds 10½ cu. ft. — lift capacity 1000 lbs. Crane lift capacity 800 lbs.

TRACTAIR

Tractair Mobildrill — a compresser and wagon drill in a single, self-contained, self-propelled unit. Universal mounting and swinging boom permits drilling at any angle. Drilling is easier and faster thanks to Le Roi-CLEVELAND air feed.



Loader with backfill blade in place of bucket. Width 6', mold board height 2'0", maximum lift above ground 1'4".

Trac-Jac consists of a Le Roi-CLEVELAND air-feed sinker drill mounted on Tractair. Feed and drilling controls are within easy reach of the operator. The mobility of this unit makes it ideal for mud-jacking and many other applications.

Here's a 75S Tractair getting the utility of air power to work. It is running two 80-lb. Le Roi-CLEVELAND Breakers. When the breaking job is done, Tractair steps up with its front-end loader. Tractair can be used also to run hard-hitting, easy-handling Le Roi-CLEVELAND sinker drills, clay spaders, backfill tampers. Moderately priced Tractair does the work quickly and pays for itself out of savings.

—Money-saving Handy Man

Combines air power and horsepower to give you greater utility for lower costs

HERE'S air power — 105 cfm — that really gets around! Good traction, low center of gravity, and Tractair's 35-hp engine give you outstanding mobility — self-propelled mobility that doesn't tie up trucks and men; mobility that saves you time and money.

That's why Le Roi Tractair can take air power anywhere any time. That's why you can make more use of work-saving Le Roi-CLEVELAND air tools to cut your costs further.

Just add a front-end loader (with its 8 quickly interchangeable accessories) and you multiply Tractair's usefulness. Not only will it handle breaking, clay digging, drilling, and tamping; but also loading, lifting, backfilling, snow-plowing, etc.

Yes, Tractair is a money-saving handy man. Watch one work — you'll see why. Make arrangements with your nearby Le Roi distributor. A new Tractair loader bulletin and job-data sheets are available. They show how Tractair saved money for others. Just write for them.

T-14

LE ROI COMPANY

MILWAUKEE 14, WISCONSIN

PLANTS: MILWAUKEE • CLEVELAND • GREENWICH, OHIO

Distributors in all these principal cities

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Your Community
NEEDS DEPENDABLE
WATER LEVEL CONTROL
BY
GA
CUSHIONED
Golden-Anderson
ALTITUDE
VALVES
Golden-Anderson Water Level Control Valves give the safety and protection needed for all elevated tanks and reservoirs. These valves maintain a uniform water level and can additionally be arranged to automatically function pumps, electrical devices or signal lights. The air and water cushioning in all Golden-Anderson valves prevents any shock or hammer and permits valve to operate smoothly at all times. Write for Bulletin W-4.
OUTLET
INLET
GOLDEN ANDERSON Valve Specialty Company
2093 Koenan Building, Pittsburgh 22, Pa.

Other Catalogs

Write directly to the manufacturers, or use coupon on Page 23

Mechanically-Stoked Refuse Incinerator

167 You get more thorough burning and guaranteed nuisance-free operation and lower labor cost when you use the new self-stoked Nichols Monohearth, according to the Nichols Engineering and Research Corp., 70 Pine St., New York 5, N. Y. Write for free booklet telling of its many successful installations.

Concrete Gun

168 The Prehy concrete gun, a portable machine, can be employed for wet or dry sandblasting operations. The Prehy concrete gun unit consists of the gun mounted on wheels with a manual hopper-charging valve. Among the accessories are 100 feet of 1¼-inch Prehy rubber material discharge hose, 50 feet of ½-inch Prehy water hose, and one Prehy magnesium discharge nozzle with interchangeable tips. For further information, write to The Prehy Co., 420 Lexington Ave., New York 17, N. Y.

Porous Media for Filtration, Air Diffusion

169 The whole story of Aloxite, aluminum oxide porous media for water filtration or for air diffusion in sewage treatment, is summed up in a new booklet by The Carborundum Co., Perth Amboy, N. J. The bulletin carries numerous charts, tables, illustrations, and material particularly helpful to the technical man.

Detect Leaks and Pipes

170 Whether you want pinpoint detection of pipes and valves, or the exact location of a leak in your water mains, Goldak has a reliable instrument to do either, and another instrument that does both jobs. Each model is described in literature available from The Goldak Co., 1544 W. Glenoaks Blvd., Glendale, 1, Calif.

Fire-Protection Equipment

171 Fire-protection equipment manufactured by M. Greenberg's Sons, 765 Folsom St., San Francisco 7, Calif., includes fire hydrants, fire valves, and other fire-department devices. The firm also issues standpipe connections, and brass and bronze products. Catalog No. 10 describes the products in full detail and will be sent you on request.

Shovels and Cranes For Pipeline Work

172 *Lorains on Pipeline Construction* is the title of a bulletin published by the Thew Shovel Co., 28th St. and Fulton Rd., Lorain, Ohio. It features the application of Lorain power shovels and cranes to pipeline construction, and discusses the Loraine Pipeliner which is a specially designed hoe with wide gauge crawlers to straddle pipeline ditches. Application of other Lorain equipment also is discussed. Write for your copy of the bulletin.

Street Lighting Transformer

173 Full information about the constant current transformer, tailor-made for series street lighting circuits, is described in *Bulletin No. SL-702* by the Moloney Electric Co., 4546 Emerson Ave., St. Louis 20, Mo. The transformer is a complete, packaged unit, and has 10 important features that make it especially useful for street-lighting purposes. Get the bulletin and find out what these features are.

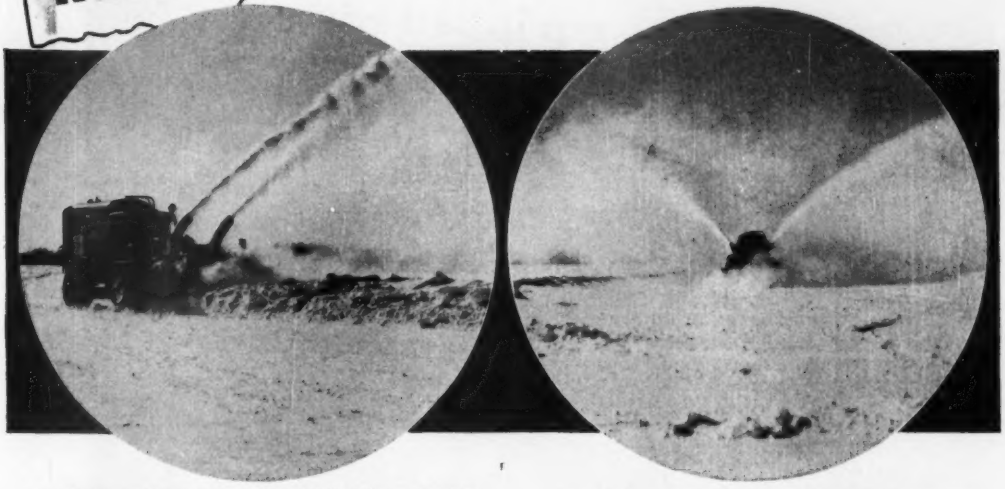
Proportioning Pumps, Force-Feed Lubricators

174 A series of bulletins dealing with its full line of chemical-proportioning pumps and force-feed lubricators is available from the Hills-McCanna Co., 3025 N. Western Ave., Chicago 18, Ill. These pumps give accurate metering results, have hand-fitted liquid ends, and specially designed check valves. Write to Hills-McCanna for more information.

(Please Turn to Page 156)

BIG NEWS!

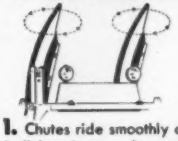
GREATER SNOW STREAM CONTROL with New BROS *"Complete Circle"* Casting Chutes



Bros Sno-Flyr rotaries equipped with new 360° rotating casting chutes at work. Left, casting windrowed snow up to 150 feet. Right, traveling 15 m.p.h. casting fresh snow to right and left, with chutes aimed to take advantage of wind direction. Notice how clearly operator can see. No "fuzzing" of streams.

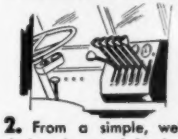
4 POINTS TO REMEMBER 4

POSITIVE CONTROL IN ANY DIRECTION



1. Chutes ride smoothly on ball bearings, under positive control from cab. Motor is hydraulic-driven. Each chute can be rotated in a full circle.

OPERATOR HAS FINGERTIP CONTROL



2. From a simple, well-designed control bank in the rotary cab, the operator has positive hydraulic control over chute action and plow operation.

RAISE OR LOWER SNOW STREAM ARC

3. Operator can change angle of each chute to cast high or low, missing nearby objects, and to take better advantage of wind. Each chute adjusts individually.

HINGED DOOR FOR QUICK ACCESS

4. Door can be opened while casting wet or heavy snow to help relieve snow pressure. Easy to clean chutes. Take-off and re-mounting is simple.

NOW YOU CAN CAST SNOW EXACTLY WHERE YOU WANT IT

Apparently winter snowfalls are becoming more and more irregular. Vehicle traffic is increasing steadily. Highway engineers and officials are finding a greater need for proper snow placement and less handling.

A rotary operator has been handicapped by rotary design limitations. He cannot efficiently control his snow streams to take advantage of all wind directions. Insufficient control has meant plugged side lanes, blocked intersections, damage to buildings and property, and additional handling costs.

Now, for the first time, 360° all-directional snow stream control is available with the new hydraulically controlled casting chutes designed by *Bros* for Sno-Flyr rotaries. The operator can aim these tubular chutes in any direction, together or separately.

You can't top *this* snow handling combination: Big capacity plus positive snow stream control, with a Sno-Flyr rotary and *Bros* all-directional chutes! Write today for information.

WILLIAM

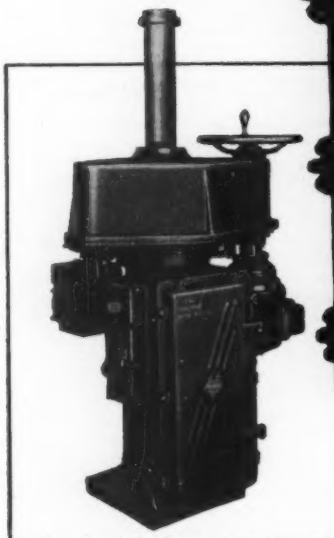
BROS

BOILER & MFG. CO.

Minneapolis 14, Minnesota

CHAPMAN SLUICE GATES

can be equipped with any required type of operating control



Shown here is the Chapman Motor Operated Floorstand for control of valves and Sluice Gates.

Chapman Sluice Gates are available in standard sizes to meet practically all installation requirements. And, where necessary, many special sizes are also available from existing pattern equipment.

Sluice Gates can be equipped with any required type of operating control — manual, hydraulic cylinder or electric motor. No matter what your problem, there is a type of operating mechanism and a size to do your job.

Chapman Motor Units are completely factory wired and ready to operate on installation. Manual control, which utilizes the gear train for easy operation, is also provided for use in case of power failure.

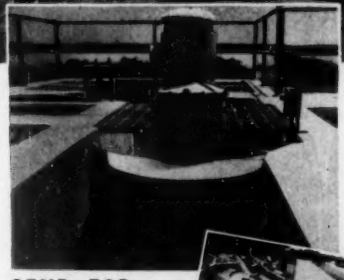
THE CHAPMAN VALVE Manufacturing Company, INDIAN ORCHARD, MASSACHUSETTS

FOR EVERY STEP OF YOUR SEWAGE TREATMENT PROCESS

WHEN you specify INFILCO Sewage Treatment Equipment, you get more than just equipment. Actually, you specify over 50 years experience in the design and manufacture of a *complete range* of water, sewage and waste treatment equipment.

You have *one source* to depend upon for experience in both chemical and biological treatment . . for the major equipment items as well as the important control devices. And by providing a *complete range* of sewage treatment equipment INFILCO offers the all-important advantage of *undivided responsibility!*

A complete laboratory and staff of competent engineers are available for making recommendations and reports to the consulting engineer or his clien.. It is, of course, intended that this service shall cooperate with the work o. your engineers. When considering your next sewage treatment plant, or the modernization of an existing one, call in your nearest INFILCO Field Engineer, or write our executive offices in Tucson.



SEND FOR..

Bulletin No. 60-C. It illustrates and describes many items of Infilco Equipment.

INFILCO

• BETTER WATER CONDITIONING • AND WASTE TREATMENT SINCE 1894

INFILCO INC.

NEW YORK 17 • **TUCSON** • CHICAGO 16

SALES OFFICES IN TWENTY SIX PRINCIPAL CITIES

WORLD'S LEADING MANUFACTURERS OF WATER CONDITIONING AND WASTE TREATING EQUIPMENT

"FLEXIBLE"

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SEWER-ROD EQUIPMENT CO.
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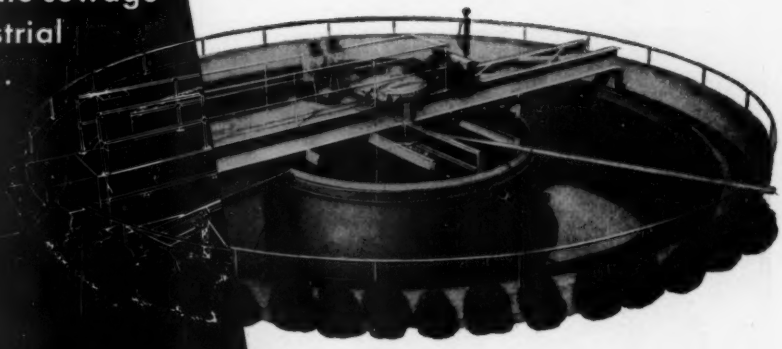
WARNING...

THE MIRO-FLEX COMPANY will not substitute inferior materials in the manufacture of its established sign line, i. e., TRAFFIC CONTROL – HIGHWAY MARKING AND STREET NAME ASSEMBLIES. Users of these signs should anticipate their needs and allow for a reasonable delay. Raw materials are extremely critical, and we feel it our duty to ask MIRO-FLEX customers to safeguard their interests. We will do our very best to maintain stocks of standard stock items. Your inquiry invited.

MANUFACTURED BY
MIRO-FLEX CO., INC.
1824 EAST SECOND STREET—WICHITA, KANSAS

new and better way

to preaerate sewage and industrial wastes . . .



the low cost **DORRCO AERATOR-CLARIFIER**

The new Dorrco Aerator-Clarifier is a compact, low-cost unit combining the functions of *preaeration, flocculation* and *sedimentation* in a single tank. It is applicable wherever it is advantageous to increase suspended solids and B.O.D. removals—where odor control or elimination is necessary—or where flocculation with or without chemicals, is beneficial. It fits equally well into primary or secondary treatment flowsheets . . . with notable advantages in both.

Highlights of Aerator-Clarifier superiority are listed at the right, but it will pay you to check the complete story of the design and operating characteristics. A Dorr engineer will gladly tell you more . . . without obligation.

DORRCO AERATOR-CLARIFIER ADVANTAGES as compared with separate preaeration and sedimentation tanks.

1. **Compact . . . single tank saves ground space.**
2. **No solids interference in aeration chamber . . . grit and heavier solids settle quickly, avoiding interference with flocculant material.**
3. **No breakup of floc structure . . . low transfer velocities from Aerator to Clarifier section eliminates breakup of flocculated material.**
4. **Minimum of short circuiting . . . spiral-flow aeration effect in Aerator minimizes short circuiting.**
5. **Simple maintenance . . . aeration tubes are removable for cleaning or replacement without interfering with operation of the unit.**
6. **Low cost . . . single tank and simple design cut installed cost.**

DORRCO

THE DORR COMPANY, ENGINEERS
BARRY PLACE, STAMFORD, CONN.

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ASSOCIATES AND REPRESENTATIVES
Dorr Technical Services and Equipment Are Also Available Through Associated Companies and Representatives in the Principal Cities of the World. Names and Addresses on Request.

DORR

RESEARCH ENGINEERING EQUIPMENT

ST. JOSEPH DOES IT THE EASY WAY

WITH

HARLEY-DAVIDSON POLICE MOTORCYCLES

Shown above are four members of the St. Joseph, Mo., Traffic Squad (left to right): Lt. Herman Stark, Tom Farmer, William Thompson, Leroy Surface, with their solo machines. Three Servi-Cars are also used by the department.

MOTORCYCLE PATROL is the easiest way to prevent accidents and enforce traffic regulations. This fact has been demonstrated in city after city where Harley-Davidson Police Motorcycles are used. A good example of the effectiveness and manpower savings possible with motorcycles is St. Joseph, Mo. There Chief of Police J. Croy Keller's efficient traffic squadron has seven modern Hydra-Glide models on daily duty. There, too, Harley-Davidsons have served police for many years, aiding dramatically in keeping accidents to a minimum and smoothing the work of the traffic officer. Champions of the race track and highways, Harley-Davidsons are unrivalled for power, flexibility, riding comfort and handling ease. They make patrolling more pleasant, speed up law enforcement, and extend available manpower over a wider range of police work. Why not learn more about the benefits your city can obtain from increased use of Harley-Davidson Police Motorcycles, Servi-Cars and Sidecars? Phone your dealer and ask him to call, or write

HARLEY-DAVIDSON MOTOR COMPANY, Milwaukee 1, Wisconsin

HARLEY-DAVIDSON

MOTORCYCLES POLICE BETTER TRAFFIC CONTROL **SERVI-CARS**

Now!

New principle for backhoes provides

UNBELIEVABLE DIGGING POWER

It's in the New Sherman Power Digger!

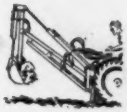
- Patented, actuated bucket gives you selective digging action, better loading, greater versatility.
- All-hydraulic action—made possible by heavy-duty hydraulic cylinders—assures efficient performance.

Specifications

Shovel reach below ground surface	8 feet
Digger reach behind tractor	10 feet
Swinging arc	140°
Trench width, standard digging shovel, single cut	18 inches
Digging shovel capacity	3.5 cu. feet
Loading shovel capacity	.5 cu. feet
Loading clearance, digging shovel, loaded	7 feet
Loading clearance, loading shovel	10 feet

- *Standard tractor mounting gives unmatched maneuverability and transportability.*

- *Digs ditches, trenches, footings, culverts, basements and other excavations.*



- *Handles roots, rocks, hard clay and oiled road surfaces.*

- *Works well behind the tractor at any angle.*

- *Actuated bucket raises high enough to load standard dump truck.*

Find out about this addition to the Sherman line of digging equipment. It is an economical answer to your digging problems. Write for literature today!

POWER DIGGER

MODEL 5487-00

Designed, Engineered and Manufactured Jointly By
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WAIN-ROY CORP. • Hubbardston, Massachusetts

Sold Exclusively By
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PATENT NO. 2,474,652 Other Patents Pending

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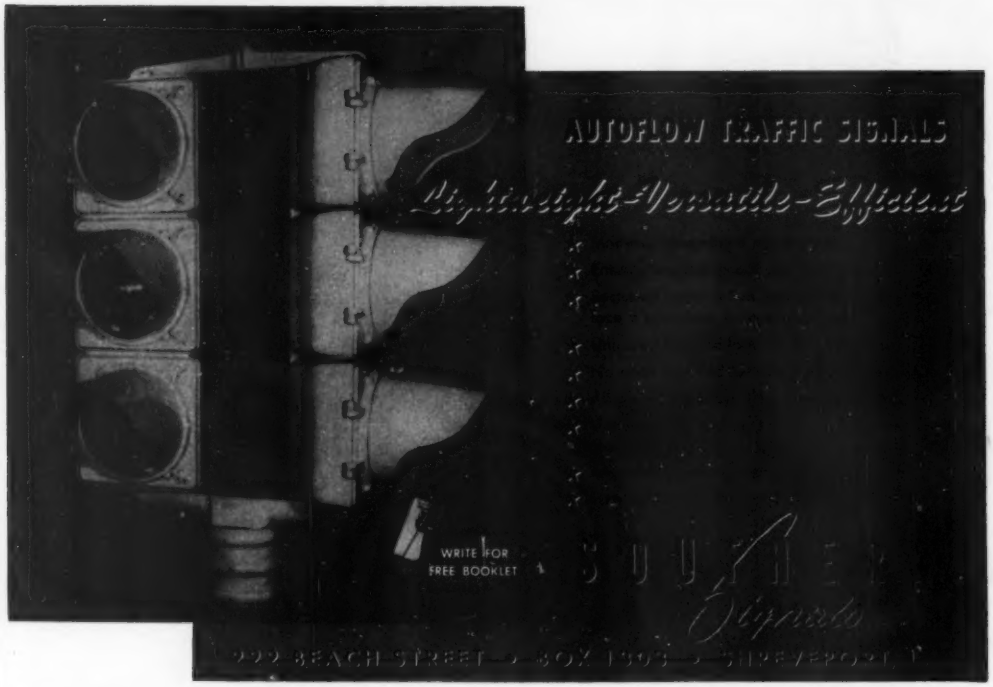

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the original lightweight, compact, precision locator **— is POWERFUL.**

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- COUPLINGS

QUICK FAST EXACT

Imitators may copy the APPEARANCE, but not the PERFORMANCE of our instrument.

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NURSERIES for the smaller children — competently manned by trained personnel.

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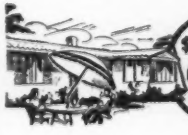
Enjoy taking your children on vacation. Ellinor Village Villas are complete deluxe homes with modern kitchens and all family furnishings. . . . Free membership in the Ormand Beach Country Club —play a championship golf course for greens fees only. Horseback riding, boating, ocean fishing . . . superb bathing on Daytona Beach. Complete resort facilities — recreations, amusements and gorgeous sightseeing. Make reservations early!



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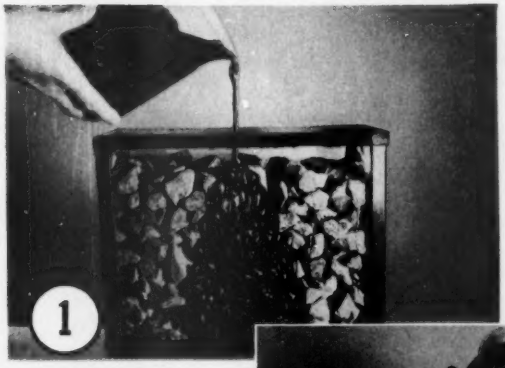
DAYTONA BEACH, FLORIDA

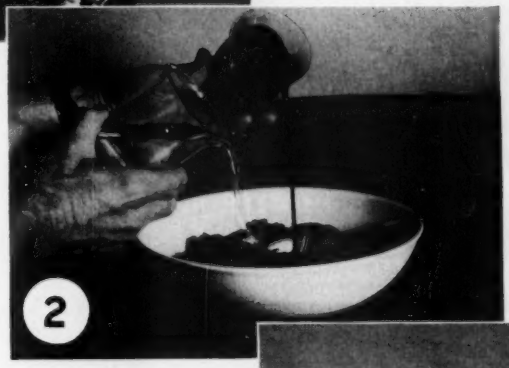
Your 3 Basic Paving Problems

Solved BETTER by Bitumuls

Only BITUMULS can perform these three functions so efficiently and at such low cost. (There are other reasons, too, but these three come first.)



It PENETRATES—
uniformly and deeply — without heating — through closely interlocked stone, damp or dry. In macadam construction, this means STABILITY because BITUMULS tacky asphalt coatings leave the stone in frictional contact.



It COATS DAMP NATIVE MATERIALS—
Only BITUMULS mixes easily and uniformly with damp, dense materials. Nothing else so efficiently treats low-cost sands and native aggregates—and gives early pavement stability with year-'round high bearing value.

It SEALS—
with precision—the RIGHT amount at the RIGHT place. This ease of precise cold application gives unsurpassed uniform, non-skid surface treatments with maximum retention of cover stone.

Whatever your paving needs, they can be filled by a correct BITUMULS specification that has already proved effective many times elsewhere. Our service engineers, skilled in the needs of your area, are ready to help YOU. Wire, phone or write our office nearest you.

Ask for these FREE booklets —data, tables, specifications.

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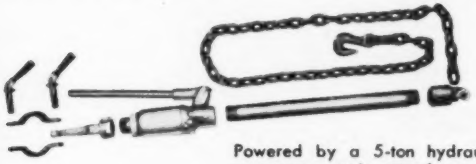
ESSENTIAL EQUIPMENT for EFFICIENT STREET AND HIGHWAY MANAGEMENT!

PORTER
HYDRAULIC
METAL POST STRAIGHTENER

Saves valuable man-hours by efficiently and quickly straightening metal posts. Used extensively by states, cities, counties and towns for straightening parking meter posts, highway signs and metal fence posts of all kinds. Pays for itself over and over again!



Powered by a 5-ton hydraulic jack with all the necessary attachments for a quick efficient set-up. Simple, safe and easy to operate! Fully portable . . . entire unit weighs only 30½ lbs.

See your supplier or write direct for prices and further information.

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Manufacturers of PORTER CUTTERS, PORTER PRUNERS and PORTER-FERGUSON Auto Body and Fender Repair Tools.

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Quality Since 1890

Excavating ✦ Trenching ✦ Dredging Rehandling

Capacities ¼ to 3 Yards . . . Ask for Bulletin No. H-850

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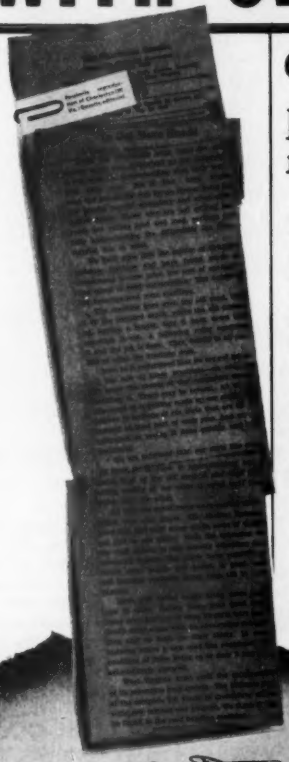
DICKINSON

WEST VIRGINIA SOLVING ROAD BUDGET PROBLEM WITH SEAMAN MIXERS!



Charleston Gazette in editorial points to Seaman as answer to road system extension . . .

The Charleston Gazette, quite properly, does not mention the SEAMAN by name, calling it only a "road-building machine," but the story is about seven SEAMAN MIXERS now in use by West Virginia. In part, here's what the Gazette says:

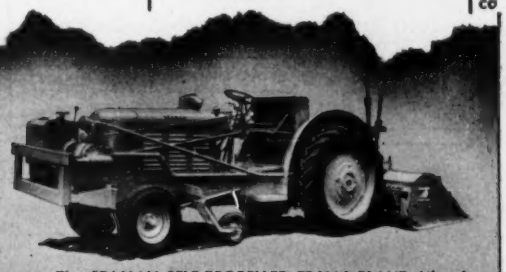
"Here is an answer to the prayers of those dwellers in West Virginia hills who are harassed by their inability to get in and out the greater part of the year. Our many miles of dirt roads — often no better than mud roads — are the cause of continual complaints . . .

"We have gone into the matter of the road building machine and have found much to recommend it — low price, low cost of operation and speed in road construction. The result of the investigation was startling.

"The machine goes over the old road . . . mixes the old material and applies a binder, lays it back down and smoothes it out. A following roller compacts it and the job is done.

" . . . It is stated that the cost of construction of this type of road is approximately one-fourth that of the old method . . ." West Virginia's experience with the SEAMAN MIXER is duplicated the country over. The SEAMAN *is by far the best answer* to high quality, low cost stabilized roads.

The SEAMAN SELF-PROPELLED MIXER 7 ft. mixing width. Gasoline or Diesel powered.



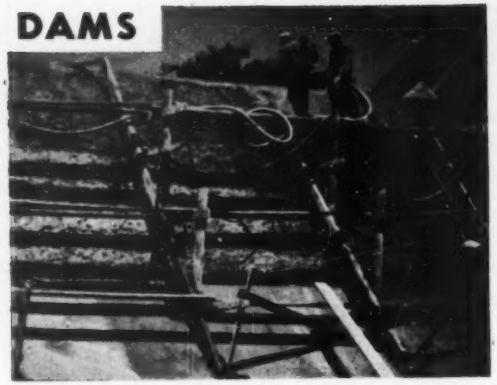
The SEAMAN SELF-PROPELLED TRAV-L-PLANT. Like the Self-Propelled Mixer except for addition of spray bar, pump, pump tachometer fifth wheel assembly and meter for precision control of bitumen or water application. 7 ft. mixing width. Gasoline or diesel powered.

Here's a Bulletin describing the SEAMAN Self-Propelled Mixer and the TRAV-L-PLANT. Sent to you FREE on request. Ask for "Self-Propelled Bulletin."

SEAMAN MOTORS, INC.

292 N. 25th Street, Milwaukee 3, Wisconsin

DAMS



repaired speedily with "GUNITE"

A 4-inch to 6-inch facing of reinforced "Gunite" was applied to the dam shown above which had badly deteriorated. This "Gunite" treatment restored this structure to years of further usefulness.
Let our engineers inspect your dams and give you repair-costs estimates for work done by experienced crews. No obligation. Our operations are nation-wide.

Write for our 48-Page Gunite Booklet

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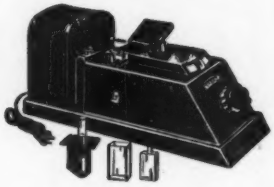
KLETT SUMMERSON ELECTRIC PHOTOMETER

Adaptable for Use in Water Analysis



Can be used for any determination in which color or turbidity can be developed in proportion to substance to be determined.

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179 East 87th Street — New York, N. Y.

M-SCOPE PIPE LOCATOR

Light-Weight MODEL-AB
Only $149.50
Metal Cased Cabinets
Superior Performance
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Pipe Finder—Leak Detector Combination Type BL $197.50

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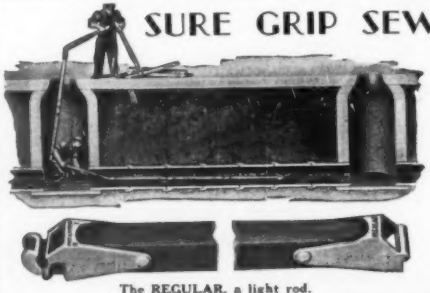
Connery's Style W Heating Kettle Made in 75, 110, 165 and 210 Gallons.

For speedy heating of Tar and Asphalt for road, street and airport runway repairs use Connery's style W kettle, the most efficient heating kettle of its kind.

Write for Bulletin 37.

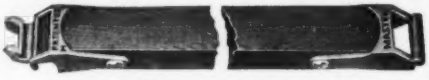
CONNERY CONSTRUCTION CO.
4000 N. Second Street — Philadelphia 40, Pa.

SURE GRIP SEWER RODS and ACCESSORIES



The REGULAR, a light rod.
Fir stock 1¼ x 1¼ inch square.

are joined together with a dual lock forming a rigid chain that will float. They can be coupled or uncoupled upon the street if desired. Made in two sizes.



The MASTER, a heavy duty rod,
Fir stock 1½ x 1½ inch square.

Write for catalog on complete line of sewer cleaning equipment.

EXPANDING SEWER MACHINE CO.
NAPPANEE, IND.

HERSEY WATER METERS

stand higher than ever in popularity among experienced Water Works Officials. Today these meters are more widely used than ever before . . . The basic engineering design of Hersey Water Meters has never been equaled.

That is the Reason

HERSEY MANUFACTURING COMPANY

SOUTH BOSTON, MASS.

FOR THE SAME REASONS

you insist on
smart-looking
company vehicles...

insist on uniforms of

REEVES QUALITY FABRICS

SMART-LOOKING EMPLOYEES mean greater public acceptance. That's why leading companies specify uniforms of Reeves Army Twill, Parade Twill and Reeves Glengarrie Poplin. For these fine fabrics wear longer and keep their crisp, good looks even after repeated washings. They're made of fine combed cotton yarn—two-ply for extra strength . . . Sanforized* and vat-dyed in colors that are fast to sun, water and perspiration.

Make sure your employees make a good, clean-cut impression on the public. Specify Reeves Fabrics in your uniforms. Write for full information.

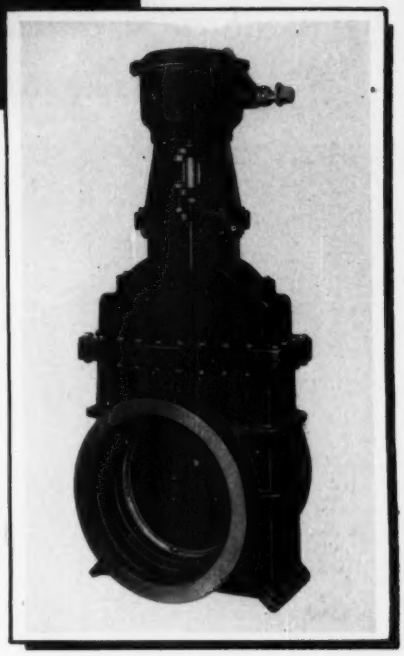
*Residual shrinkage less than 1%

Reeves also makes BYRD CLOTH, REEVECORD, REEVROY CORDUROY, PLAID DENIM and other nationally known quality cotton fabrics.

REEVES BROTHERS, Inc., 54 Worth Street, New York 13, N. Y.

Representatives in: Atlanta · Boston · Chicago · Cleveland · Dallas · Los Angeles · Philadelphia · Portland, Oregon · St. Louis · Montreal · Toronto

RENSSELAER
SQUARE BOTTOM GATE VALVE

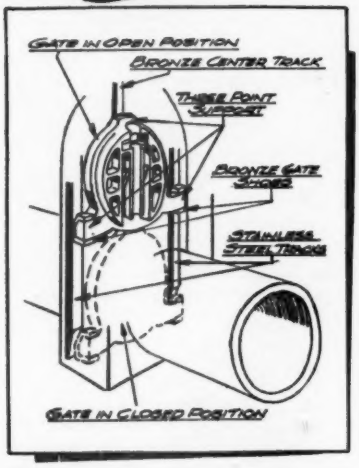


Your best bet

FOR

EMERGENCY SHUTOFF
FREQUENT OPERATION
THROTTLING
VERTICAL PIPE LINES

because



What 3-point Support Means

1—Valve closes easily under high differential head
2—Valve operates frequently without excessive wear.
3—Valve can be used for throttling without damaging seat rings.
4—The gates are properly supported for operating in vertical lines.

YOU know that throttling service leaves a valve partially open—in which case, an improperly supported downstream gate is under pressure to tilt into the downstream port opening and to score the face of both gate and seat rings.

THIS CAN'T HAPPEN in a Rensselaer Square Bottom Gate Valve—because the gate is properly supported at THREE POINTS during its full length of travel. It can't tilt. The diagram shows why, in detail.

In EVERY respect, this gate valve is designed for long life under severe operating conditions. For instance—during its entire operation, the gate ring is held completely free from contact with the seat ring, by stainless steel tracks, and bronze mounted gate lugs until near the closing point. Then the tracks taper, allowing contact between gate and seat.

Without obligation on your part a Rensselaer representative will be glad to give you the benefit of his experience in Valves, Hydrants and other Rensselaer products. Call our nearest office.

LEADERSHIP FOR OVER 65 YEARS

RENSSELAER
VALVE COMPANY

Hydrants • Gate Valves • Square Bottom Valves
Check Valves • Tapping Sleeves and Valves • Air Release Valves

TROY, NEW YORK
Division of Neptune Meter Company

Atlanta, Bala-Cynwyd, Pa., Chicago, Denver, Haverhill, Mass., Kansas City, Los Angeles, Memphis, Oklahoma City, Pittsburgh, San Francisco, Seattle, Waco.

LET SUMMERS COME...and WINTERS GO

THESE ROADS WILL SERVE YOU WELL...

Blending with every landscape and free from glare, roads built with Tarvia* road tar take the strain out of driving. They are self-healing under impacting traffic.

The heat-absorbing qualities of black roads built with Tarvia* road tar make them easier to keep open in winter, as snow and ice melt more quickly. And they are not affected by chemicals used to remove snow and ice.

because

1. Roads built with Tarvia* road tar improve with age. Occasional applications will renew the life of the surface, and replace worn-away material.

2. TARVIA road tar penetrates surfaces and binds together the underlying material. It thus makes possible the inexpensive use of local aggregates.

3. Less TARVIA road tar is required because there are less solvents to be evaporated before the binder becomes effective.

4. TARVIA road tar is unaffected by gasoline, kerosene, or moisture. It retains its original properties.

5. TARVIA road tar holds the aggregate tightly in the surface, and produces a gritty surface which is lastingly skid-resistant.

6. TARVIA road tar may be applied at moderate temperatures, and with ordinary equipment.

The Barrett field man is always at your call for expert practical advice.

Barrett* Tarvia* ROAD TAR

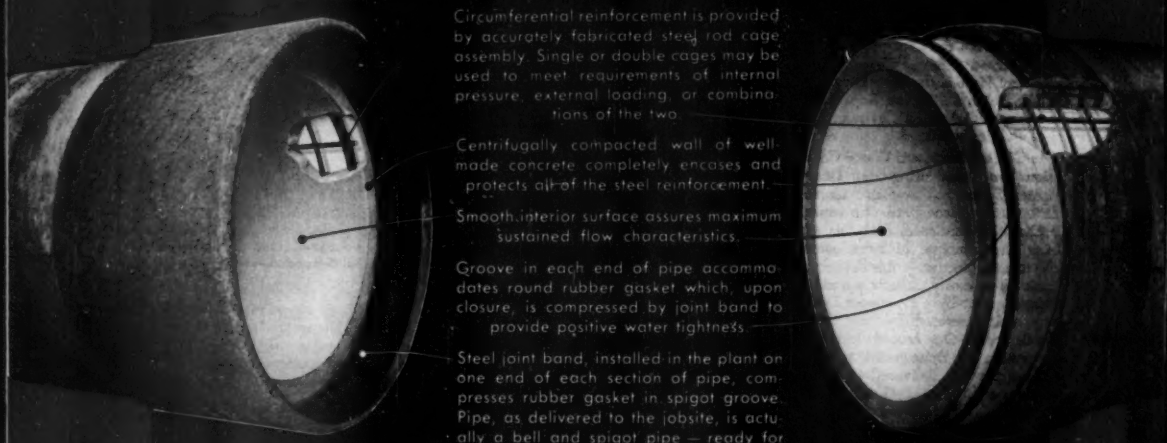
THE BARRETT DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

*Reg. U. S. Pat. Off.

New York • Chicago • Birmingham • Detroit • Philadelphia • Boston • Rochester • Youngstown • Ironton, O. • Syracuse • Buffalo • Bethlehem, Pa. • Portland, Me. Norwood, N. Y. • Oneonta, N. Y. • Elmira, N. Y. • Cromwell, Conn. • Norwich, Conn. In Canada: THE BARRETT CO., LTD., Montreal • Toronto • Winnipeg • Vancouver

Could the dependable qualities of this pipe help you reduce the cost of delivered water?

Centrifugally spun, reinforced concrete pressure pipe with double rubber gasket joints combines strength of steel with permanence of concrete.



Circumferential reinforcement is provided by accurately fabricated steel rod cage assembly. Single or double cages may be used to meet requirements of internal pressure, external loading, or combinations of the two.

Centrifugally compacted wall of well-made concrete completely encases and protects all of the steel reinforcement.

Smooth interior surface assures maximum sustained flow characteristics.

Groove in each end of pipe accommodates round rubber gasket which, upon closure, is compressed by joint band to provide positive water tightness.

Steel joint band, installed in the plant on one end of each section of pipe, compresses rubber gasket in spigot groove. Pipe, as delivered to the jobsite, is actually a bell and spigot pipe — ready for quick, easy installation.

Appearance of bell and spigot ends just prior to closure. Inside and outside annular spaces are completely filled with cement mortar.

In recent years, development by this company of the Double Rubber Gasket Joint for centrifugally spun pipe has greatly increased its versatility and adaptability. It is proving outstandingly successful in a wide variety of installations throughout the West. Here are typical examples:

Coachella Valley County Water District, Coachella, Calif. (U.S. Bur. of Reclamation Project), Units 5, 6 and 7–270,000′, 12″ thru 72″; operating heads up to 75′.

Olympia, Wash. (McAllister Springs Water Supply Line) 35,000′, 36″; operating head, 150′ max.

San Diego County Water Authority (San Diego Aqueduct–Sweetwater Extension) 23,500′, 18″–24″; operating heads up to 130′.

Available in diameters from 12″ through 84″, and for moderate operating heads (generally up to 125′), this pipe is another example of American's ingenuity and skill in the development of better products for water supply lines. Further information is available upon request.

American PIPE AND CONSTRUCTION CO.

Concrete Pipe for Main Water Supply Lines, Storm and Sanitary Sewers, Subaqueous Pipe Lines.

P. O. Box 3428, Terminal Annex • Los Angeles 54, California

QUALITY PIPE LINE PRODUCTS MANUFACTURED AND INSTALLED BY AMERICAN INCLUDE HUME CENTRIFUGAL CONCRETE PRESSURE PIPE, AMERICAN CONCRETE CYLINDER PIPE, PRESTRESSED LOCK JOINT CONCRETE CYLINDER PIPE, LOCK JOINT CONCRETE CYLINDER PIPE.

Main Offices and Plant—4635 Firestone Boulevard, South Gate, California — District Sales Offices and Plants — Oakland — San Diego — Portland, Oregon.

CINCINNATI IS WHIPPING THE HIGH COST OF BULK RUBBISH COLLECTION

Man-hours required for big tonnage collection cut 60 percent.

The City of Cincinnati gives Eight Reasons Why the Dempster-Dumpster System cuts bulk trash and rubbish collection costs and cuts work time from 2.43 man-hours to .98 man-hours per ton of material delivered to incinerator.

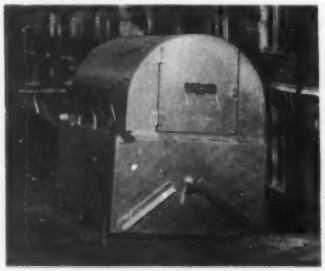
Recently a large Southwestern city, investigating the Dempster-Dumpster System of trash and rubbish collection, requested information from the City of Cincinnati on results obtained with the Dempster-Dumpster System. Here is the reply they received from Mr. Ralph C. Taylor, Superintendent of the Waste Collection Division, Department of Public Works.

"The City of Cincinnati Waste Collection Division has been using the Dempster-Dumpster System to augment its regular collection set up since 1948. Our experience since that time indicates that this system, utilizing the principal of large containers which can be left at rubbish accumulation points and easily picked up and carried to disposal point by a Dempster-Dumpster pick-up unit operated by the driver, is highly desirable. Our records indicate that the operation of these units require .98 man-hours per ton delivered to the incinerator as compared to 2.43 man-hours per ton needed in the operation of conventional pick-up with dump truck and crew.

"I have listed below some of the advantages of the Dempster-Dumpster System as we see them.

"1—These large heavy duty containers can be placed on the ground or in specially designed pits if so desired at the point of accumulation and loaded directly by the recipients of the service rather than placing the waste in some intermediate container. This eliminates rehandling by the collection forces in loading into standard collection units, a costly process.

"2—These containers offer a low loading height, making their application easy to any given situation.



AN APARTMENT TYPE detachable Dempster-Dumpster Container is shown above at accumulation point.

ONLY ONE MAN, THE DRIVER, is required in the Dempster-Dumpster System of municipal trash and rubbish collection. Driver is shown above attaching lifting chains to a drop bottom container. He will return to cab and from hydraulic controls hoist pre-loaded container into carrying position and drive to disposal area where materials will be dumped automatically.

"3—This system eliminates the idle time of trucks standing while loading at these points of large accumulations and eliminates lost labor time waiting for the trucks to return after its trip to the disposal area.

"4—The containers are of rugged construction and are practically indestructible. We feel that one of these containers over a period of time will cost less to buy and maintain than the refuse cans it replaces.

"5—Where necessary, leakproof containers may be used, eliminating the spillage of noisome wastes and the resulting unsanitary conditions.

"6—The rat nuisance is practically eliminated with this type of container and we have several outstanding examples where remarkable cleanups were made.

"7—Litter around the loading station is practically eliminated by the use of these containers. This is in outstanding contrast to stations using a great number of the conventional trash cans where the handling of lids and cans by the users usually results in overloading and improper covering.

"8—These detachable containers lend themselves readily to clean dumping at the disposal point. They can also be kept clean and sanitary with greater facility than the small container.

"At the present time in Cincinnati the Waste Collection Division is using these containers for both combustible and non-combustible wastes at the following type of institutions where large quantities of wastes are produced: Schools, Railroad Passenger Terminal (garbage from dining cars), Railroad Produce Terminal, Hospitals, Large Apartment Developments, Social Benefit Functions and Feasts, Circuses and Fairs."

Cities and towns everywhere are installing the Dempster-Dumpster System because no other method of bulk rubbish handling by truck can match the Dempster-Dumpster System in low cost of operation, efficiency, sanitation and good housekeeping! For a cleaner city and a lower budget, it will pay you to investigate the Dempster-Dumpster System. Write today for complete information. A product of Dempster Brothers, Inc.

DEMPSTER-DUMPSTER Container with drop bottom dumping action is shown above as it begins to open hydraulically and discharge trash and rubbish.

DEMPSTER DUMPSTER
TRADE MARK REG.

DEMPSTER BROTHERS
812 DEMPSTER BLDG.
KNOXVILLE 17, TENNESSEE

WHEN YOU CHOOSE AN FWD...YOU CHOOSE

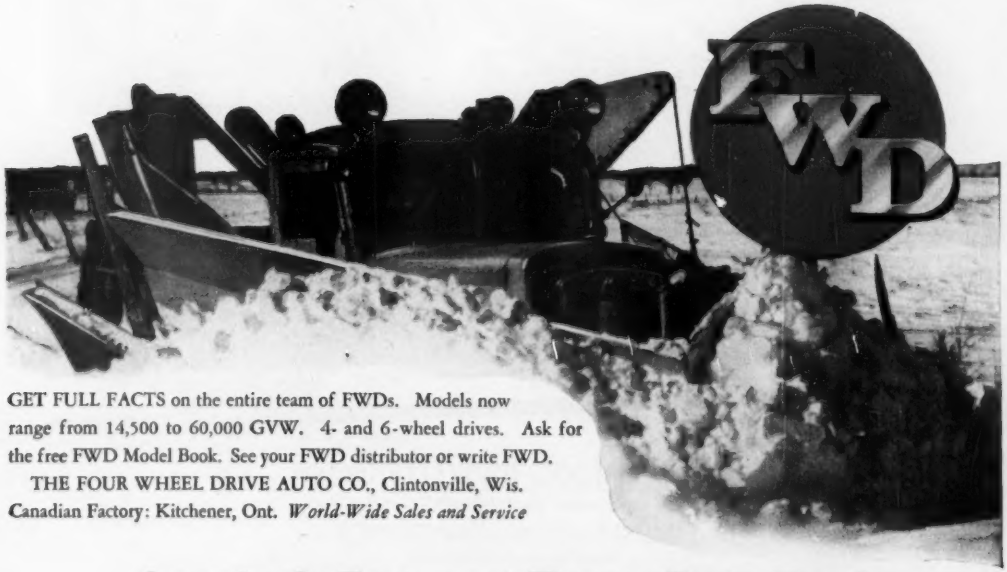
Lower Cost per Year

You choose the ability to DO MORE WORK PER YEAR

"When other trucks must stay at home . . . our FWDs are on the job. It pays out the year 'round on hauling . . . maintenance . . . snow and ice control . . . doing a *better* job and with *greater safety* — both on or off the highway."

You choose lower maintenance costs . . . longer truck life

"Our FWDs need fewer repairs because there's less strain . . . both load and power are properly distributed. We've found that an FWD has up to twice the life."



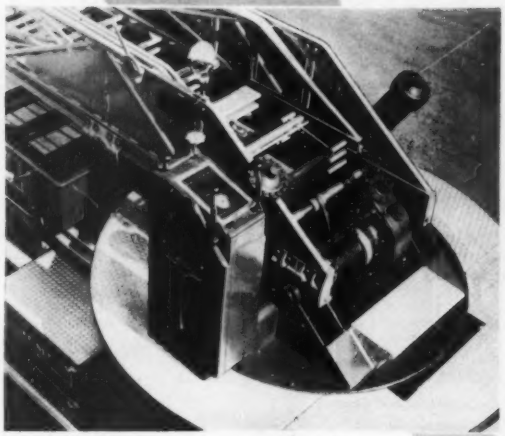
GET FULL FACTS on the entire team of FWDs. Models now range from 14,500 to 60,000 GVW. 4- and 6-wheel drives. Ask for the free FWD Model Book. See your FWD distributor or write FWD.

THE FOUR WHEEL DRIVE AUTO CO., Clintonville, Wis.
Canadian Factory: Kitchener, Ont. *World-Wide Sales and Service*

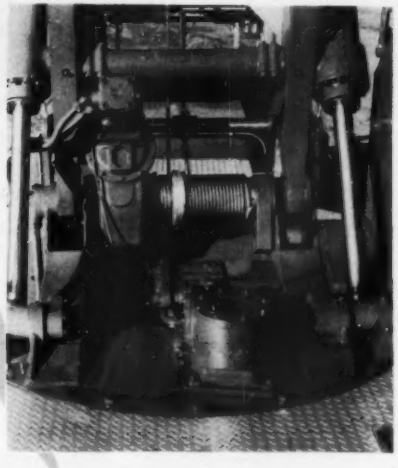
America's Foremost Heavy-Duty Truck

THERE'S *Extra Value* IN

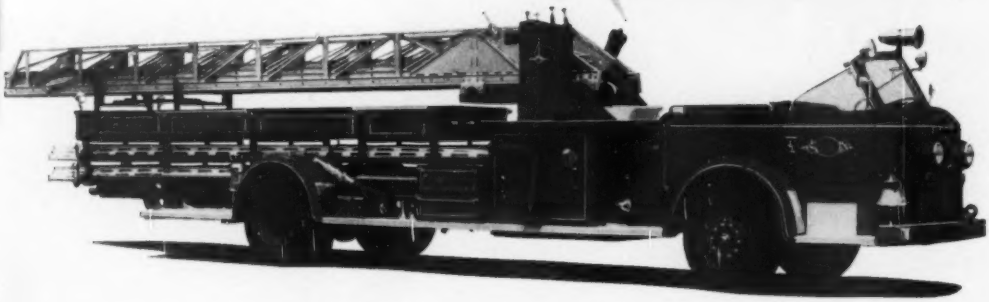
THE Extra Values in the American La-France 4-wheel aerial are provided for greater ease of operation, greater safety for the firemen, more stability in aerial ladder use, and easier inspection of all operating units. The cab - ahead - of - engine design gives more visibility and safety for the driver, easier steering and shorter turns. The all-steel aerial ladder for greater safety and load capacity.



- Larger platform (94 in. diameter) affords ample room with safety for all operations. Platform of heavy steel with non-skid safety tread surface.



- All hydraulic power units are accessible. All piping is metal tubing, no rubber hose.

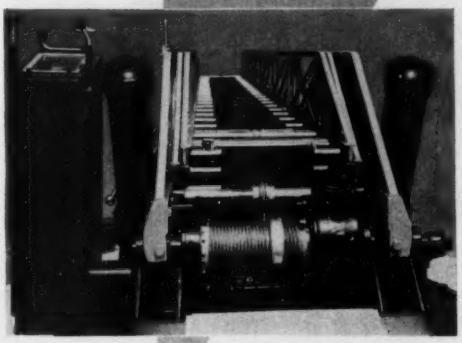


AMERICAN-LA FRANCE-FOAMITE CORPORATION
ELMIRA, NEW YORK, U. S. A.
LA FRANCE FIRE ENGINE AND FOAMITE LIMITED
TORONTO 9, ONTARIO, CANADA

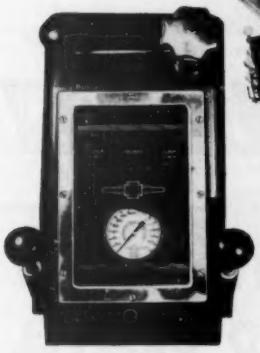
AMERICAN - LAFRANCE AERIAL TRUCKS . . .

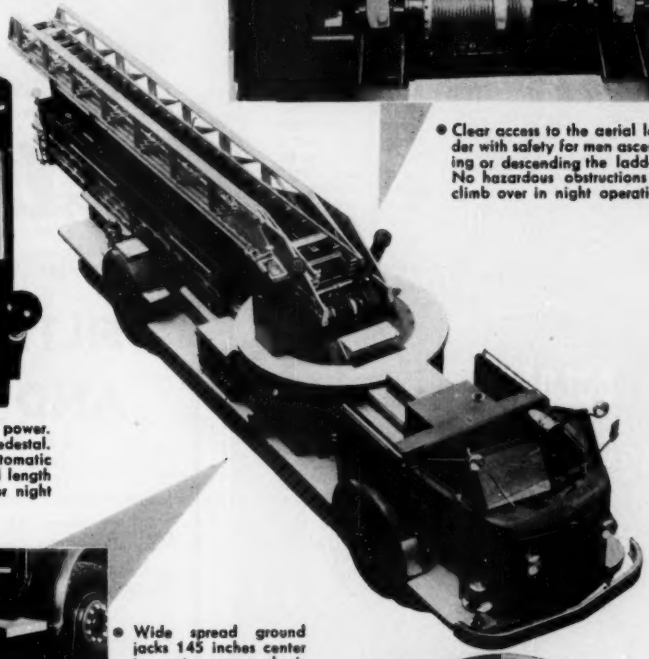
Exclusive Aerial Features include

- 65 inch diameter turntable, double row ball-bearing, for more ladder stability.
- Turn-buckles for all cable adjustments. No cables to disconnect, no hand stretching of cables.
- Safety limit on hydraulic power for retracting fly sections—no rungs or cable damage if locks are not released before retracting.
- Safety limit of hydraulic power in lowering ladder. Excess power cannot be applied to lower ladder when extended and supported at outer end by a building or structure.

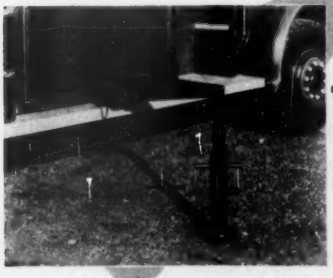


- Clear access to the aerial ladder with safety for men ascending or descending the ladder. No hazardous obstructions to climb over in night operation.





- All operations by hydraulic power. All controls in control pedestal. Visual load indication, automatic registration for all angles and length extended. Indirect lighting for night operations.

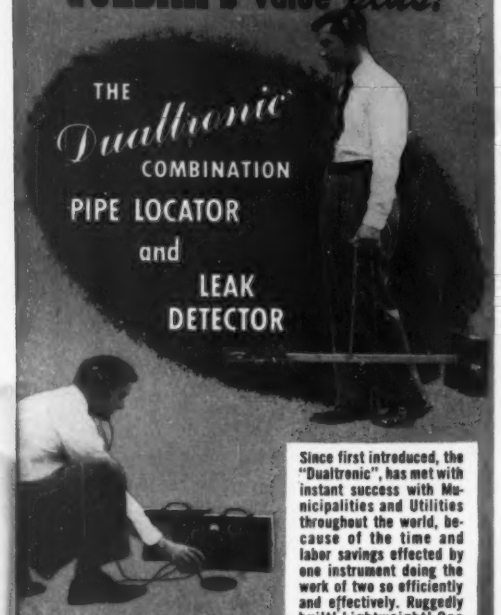


- Wide spread ground jacks 145 inches center to center across chasis for maximum safety and ladder loading. Quick acting mechanical type positive when set. Hinged to permit truck movement in emergencies without retracting.

- Sixth in a series of advertisements featuring Extra Values in American LaFrance fire apparatus.

GOLDAK'S value plus!

THE Dualtronic COMBINATION PIPE LOCATOR and LEAK DETECTOR



Since first introduced, the "Dualtronic", has met with instant success with Municipalities and Utilities throughout the world, because of the time and labor savings effected by one instrument doing the work of two so efficiently and effectively. Ruggedly built! Lightweight! One man operation! The "Dualtronic", is the answer on how to cut costs 50%!

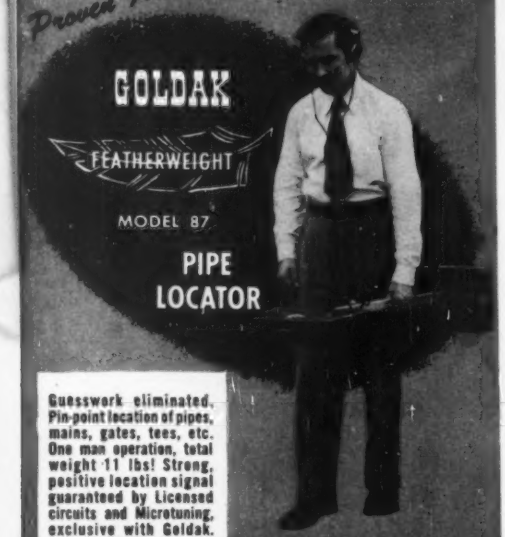
Proven Ability!

GOLDAK

FEATHERWEIGHT

MODEL 87

PIPE LOCATOR



Guesswork eliminated. Pin-point location of pipes, mains, gates, tees, etc. One man operation, total weight 11 lbs! Strong, positive location signal guaranteed by Licensed circuits and Microtuning, exclusive with Goldak. Lasts a lifetime, guaranteed performance. Write for FREE literature!

GOLDAK

PIPE LOCATORS

1544 W. Glenoaks Blvd.

Star Performers on Important Duties

Aurora Non-Clog Pumps, both Vertical and Horizontal have won high favor

— for industrial by-products, semi-solids, wastes, municipal sewage plants, lift stations, buildings and all duties involving the handling of heavy liquids and liquids containing solids.

PUMPS "by Aurora"

Type KGG Aurora Horizontal Non-Clog Pump

Write for BULLETIN 121

Write TODAY for CONDENSED CATALOG "M"

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA Always PUMPS

AURORA PUMP COMPANY

66 Loucks St., AURORA, ILLINOIS

FILTER SAND AND GRAVEL

Produced from an inland pit hence free from river contamination and foreign matter.

Shipment in bulk or bagged.

Many of the larger filter plants throughout the United States are equipped with our products.

Prompt Shipment

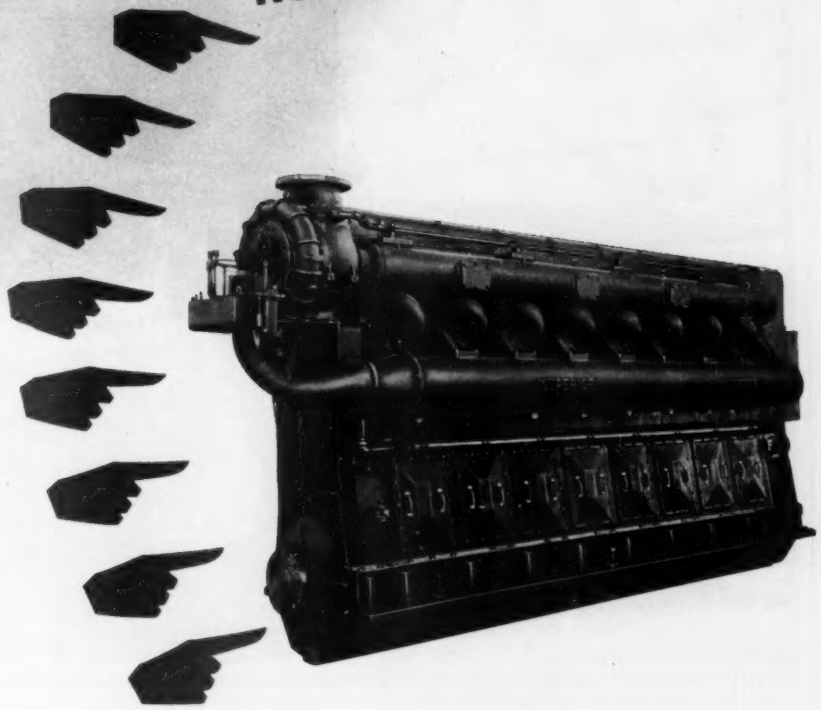
Inquiries and orders solicited

NORTHERN GRAVEL COMPANY

Muscatine, Iowa

P. O. Box No. 307 Phone: 193

NO PAMPERING REQUIRED



You won't get kid gloves with your Superior or Atlas engine. You just start it . . . and bank the savings it runs up on fuel and maintenance.

Superior and Atlas engines are built to extra-high standards of precision and materials. They are conservatively rated to give you a power cushion against sudden overloads. They are designed to be economical on fuel . . . to operate day-in and day-out with a minimum of down-time for maintenance and repairs. And the builders of Superior-Atlas engines combine 100 years of engine-building experience . . . with continent-wide service facilities.

Your best buy in engines for electric power generation and direct-drive applications is a Superior or an Atlas with the dependable, economical 4-cycle principle . . . in diesel, gas or dual-fuel types . . . in sizes up to 1500 HP.

And may we send you literature on these dependable, economical engines to meet your requirements?

Superior ENGINES

ATLAS Imperial DIESEL ENGINES

THE NATIONAL SUPPLY COMPANY
ENGINE DIVISION
SPRINGFIELD, OHIO

NATIONAL OIL FIELD MACHINERY AND EQUIPMENT...
SPANG PIPE...SUPERIOR & ATLAS ENGINES

Baltimore's Battle Monument to her heroic dead in the War of 1812, as it looked 100 years ago.

Baltimore, Maryland has cast iron water and gas mains in service that were installed more than a century ago. In addition, there are more than 28 other cast iron water or gas mains with known records of continuous service for more than 100 years in the older cities of the United States and Canada. Such service records prove that cast iron pipe not only resists corrosion effectively, but is endowed with all the strength factors that pipe laid under city streets must have to meet the stresses imposed by modern conditions of traffic and underground services.

United States Pipe and Foundry Co.,
General Offices, Burlington, N. J.
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U.S.
cast iron
PIPE
FOR WATER, GAS, SEWERAGE AND INDUSTRIAL SERVICE

NUMBER TWO OF A SERIES

O.K.'d BY CHICAGO all ways

CHECKED and DOUBLE CHECKED FOR ALMOST TWO YEARS . . .

No hit or miss or snap judgment dictated Chicago's Council action last November. On the contrary MILLER METER selection (15,000 strong) came, only after nearly 2 years of checking . . . double checking . . . correlating the convincing facts and figures established by the administration's full resources, such as:—

- ☑ FIELD SURVEYS
- ☑ SPECIFICATIONS
- ☑ ENGINEER'S LABORATORY TESTS
- ☑ FINANCE COMMITTEE APPROVAL
- ☑ DIRECTOR OF PURCHASES APPROVAL

What Chicago did (O.K.'d *MILLER METER all ways*) and 860 other cities have done, you and YOUR administration can and should also do. For complete details about our improved '51 model, write us today!

835 NO. WOOD STREET **DUNCAN PARKING METER CORP.** CHICAGO 22, ILL.

Main St., Longmont, Col. looking south from 4th Ave. 30 years ago and today. Built in 1915 it still is in excellent condition and as part of U.S. Highways 87 and 287 it carries more than 5,000 vehicles per day.

A short story about long service— *CONCRETE STREETS* in Longmont, Col.

LONGMONT, Col. paved its first street with concrete in 1915. By 1923 it had 105,000 sq. yd. of concrete in service on its busiest streets.

Angus E. Slee, City Engineer of Longmont for 14 years, has this to say: "After 28 to 35 years of service, this paving is in excellent condition. Practically the only maintenance that has been required has been the filling of expansion joints with tar every two or three years. A conservative estimate of the probable life of this paving would be another 70 years."

"This contrasts very sharply with our experience with a lower type of paving placed in residential districts commencing in 1933. While lower in first cost, this paving has to be replaced completely every two to three years. We have spent enough on maintenance and replacement of this type of surface to have put in portland cement concrete paving, and our residential streets are still a constant source of expense and complaints."

Other city officials all over America also have learned that concrete pavement lasts longer and needs less maintenance. They have discovered too that concrete pavement usually costs less to build than any other pavement of equal load-carrying capacity and that in the long run all these factors add up to ***low annual cost,*** making concrete the best pavement buy for any city.

For more information write for a free copy of the 112-page booklet, "*Concrete Pavement Design.*" Distributed only in the United States and Canada.

PORTLAND CEMENT ASSOCIATION

Dept. A2-4, 33 W. Grand Ave., Chicago 10, Ill.

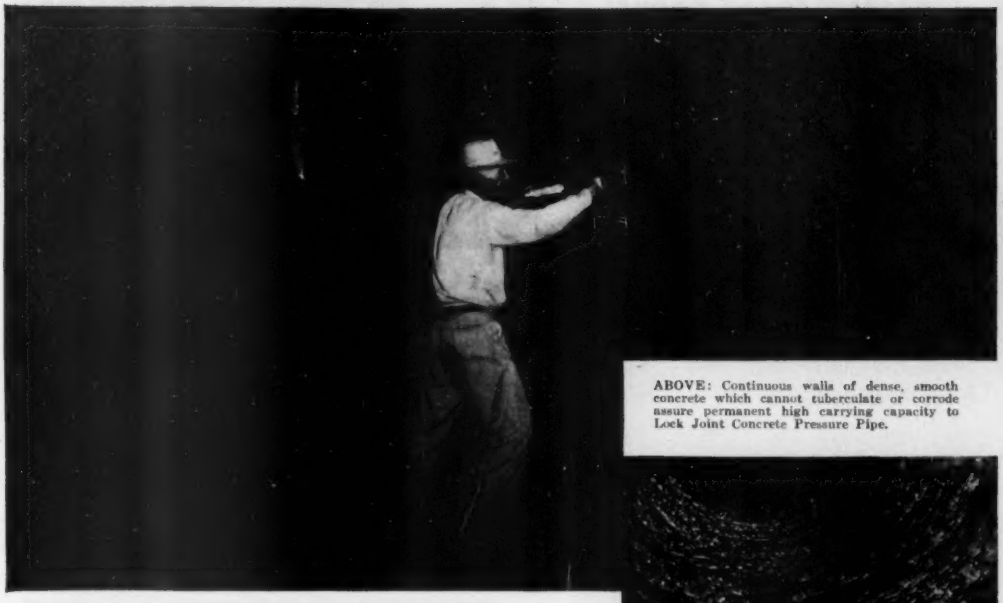
A national organization to improve and extend the uses of portland cement and concrete . . . through scientific research and engineering field work

Left: 4th Ave., looking east from Bross St. Built in 1916 it still is giving dependable service today.

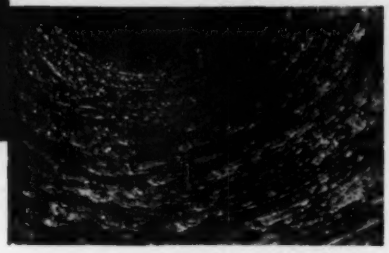
•

Right: 5th Ave., looking east from Gay St. Built in 1919, this pavement is in good condition after rendering over 30 years of uninterrupted service.

CONCRETE *is the answer to your main problem*



ABOVE: Continuous walls of dense, smooth concrete which cannot tuberculate or corrode assure permanent high carrying capacity to Lock Joint Concrete Pressure Pipe.



ABOVE: The tuberculated condition of this metallic pipe line reduces its carrying capacity by 50%.

Tuberculated mains—corroded mains—leaky mains—all cost municipalities, taxpayers and industry immense sums every year in added pumping costs, maintenance and repairs. Yet, by the use of Lock Joint Concrete Pressure Pipe, all of this unnecessary expense could be eliminated.

1. LOCK JOINT PRESSURE PIPE does not tuberculate . . .

RESULT
- No excessive pumping costs
- No periodic cleaning costs
- No loss of income from inadequate delivery of water to the consumer

2. LOCK JOINT PRESSURE PIPE does not pit or perforate from electrolysis or corrosion

RESULT
- No cost for major repairs
- No cost for periodic patchwork
- No loss of revenue while the line is shut down for emergency repairs.

Consider these facts when you plan your next water supply or transmission main and specify Lock Joint—the pressure pipe of perpetual economy.

Lock Joint Pipe Company for over forty years has specialized exclusively in the manufacture of reinforced concrete pipe for water supply and transmission mains as well as for sewers, culverts and subaqueous installations.

LOCK JOINT PIPE COMPANY

Est. 1905

P.O. Box 269, East Orange, N. J.

PRESSURE PIPE PLANTS: Wharton, N. J., Turner, Kan., Detroit, Mich.

BRANCH OFFICES: Casper, Wyo. • Cheyenne, Wyo. • Denver, Col. Kansas City, Mo. • Valley Park, Mo. • Chicago, Ill. • Rock Island, Ill. Wichita, Kan. • Kenilworth, N. J. • Hartford, Conn. • Tucumcari, N. Mex. Oklahoma City, Okla. • Tulsa, Okla.

LOW-COST HOPTO
DIGGER-CRANE-SHOVEL

Uses power you already have!

"HOPTO" . . . that's the compact digger-crane-shovel that gives *multiple performance* at lower cost. Versatile "Hopto" digs, ditches, loads and handles materials far ahead of your production schedule.

The trailer-type "Hopto" attaches in 60 seconds and operates from the power take-off of any tractor, jeep or truck, or it may be truck mounted. You can see the profits lift as it reaches out 14'6" in a 180° swing. "Hopto" moves 15 to 30 yards of earth an hour with a ⅛ yard capacity bucket while cutting up to a depth of 9'.

The heavy-duty industrial hydraulic system gives a lifting capacity of over 2000 pounds to the low clearance boom. A Crane extension is available as extra equipment. The "Hopto" can be equipped with Enclosed, Skeleton and Shovel buckets 14" to 24" wide. The bucket's reversible teeth are of cast alloyed steel, heat treated for longer life.

"HOPTO" HYDRAULIC POWER GIVES FAST, CLEAN DIGGING FOR:

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Full Track | Rubber Mounted | P.T.O. Trenchor

Before you invest in new equipment, see Badger's complete line of trench excavators and diggers, self-propelled or power take-off operated.

Write Today! **FREE FOLDER** Bulletin 19503 Gives Complete Information

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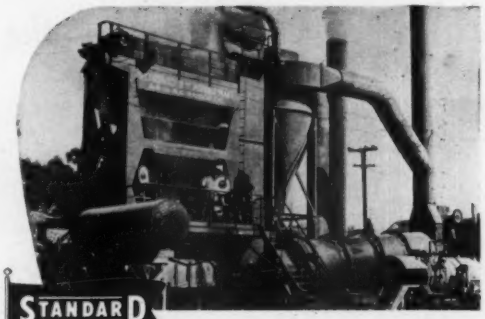

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MONEY-SAVING PAVING PLANTS

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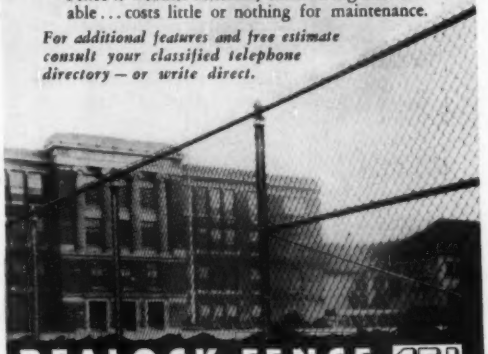
PROTECTION PLUS

Here are some of the *extra* protective advantages you get when Realock Fence guards your property.

. . . All fittings, hinges and locking devices have bolts *on the inside*, secure from tampering.

. . . Heavily galvanized by a special process, Realock Fence is weather-resistant, extra strong and durable . . . costs little or nothing for maintenance.

For additional features and free estimate consult your classified telephone directory — or write direct.



REALOCK FENCE CF&I

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THE CALIFORNIA WIRE CLOTH CORP. 1000 - 19th Avenue, Oakland 6, California
BRANCHES & DISTRIBUTORS IN KEY CITIES EVERYWHERE

Here's what users say about MI-CO Parking Meters

On the strength of the performance of 304 MI-CO Parking Meters, a city in New York State purchased 1083 more. The city manager recommended the purchase "because of low maintenance; little lost revenue as they are rarely out of service; ease of enforcement since violations can be seen from both sides of meter." And "because maintenance men can make the repairs that might be necessary quickly without returning parts to the factory."

A city in Virginia with parking meters—both automatics and manual types in service at various times since 1938—reports: "Over this period of years we have found that the MI-CO manual type has and is giving us the best service of them all with considerably less maintenance and trouble."

Michigan reports: "You may be interested to know that during December 1949, with a total of 955 parking meters in service, there were only 51 reported out of commission for all causes. These were repaired within a matter of a few hours, so that comparatively little time was lost."

Ontario, Canada, has this to say about MI-CO's: "Your meters have not only solved our parking problem, but have been easy to service, and have stood up mechanically through one of the toughest winters that we have experienced."

There are scores of others. We'll be glad to supply you with documentary evidence from installations all over the country attesting the dependability of MI-CO Parking Meters. Proof like this should have an important bearing on your decision as to the right meter to buy. You can't go wrong with MI-CO. It will outwork, outlive and outearn more expensive and more complicated meters. MI-CO has proved its dependability everywhere ... even at 40° below zero in Alaska. May we send you all the facts?

MI-CO METERS, 231 COURT STREET, COVINGTON, KENTUCKY
Division of The Michaels Art Bronze Co., Inc.

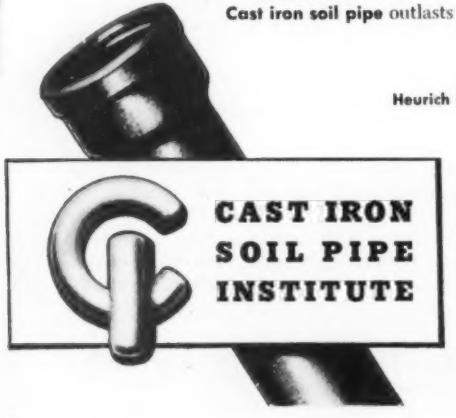
Above or below ground — **CAST IRON SOIL PIPE**

What other available material has been tested by time?

Local health authorities have long recognized the importance of soil and waste disposal lines that will stand up under a beating year in, year out — decade after decade! **Cast iron soil pipe** is the plumbing material that has withstood the test of *generations. Can you pick up a plumbing code anywhere in the country that isn't built around cast iron soil pipe and fittings?*

Cast iron soil pipe outlasts any buildings, guards your community against dangers such as ground water pollution and escaping sewer gas. Moreover, you eliminate later street openings, trench excavations, backfill and repaving for a job that should have been done right in the first place.

Your plumbing code is protecting your community's health—and dollars—when it gives preference to **cast iron soil pipe** and fittings. It's the only way you can be *sure.*



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Heurich Building, 1627 K. St. N.W., Washington 6, D. C.

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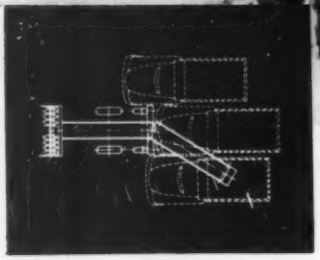
New model 548-A SNOW LOADER

Clears streets fast
Saves up to 75% trucking costs...



Parallel Loading Speeds Traffic—Cuts Loading Time

The 548-A's hydraulically operated Swivel Boom Conveyor facilitates fast loading with least interference to traffic.

In the new 548-A Snow Loader, Barber-Greene offers many features of importance to those responsible for keeping busy streets clear of traffic-bogging snow. The pneumatic-tired 548-A is equipped with the B-G Swivel Discharge Conveyor that reaches over truck cabs . . . allows trucks to travel in same direction, behind or on either side of the loader . . . cuts trucking costs as much as 75% through more efficient loading. Spiral feed assures down-to-the-pavement clean-up of up to 20 cu. yds. per minute. Truck-type, four-wheel drive, and four-speed transmission. Enclosed cab is optional. Ask your B-G distributor about other advanced features.

BARBER · GREENE COMPANY AURORA, ILLINOIS

Constant flow Equipment

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If you have hesitated to consider new methods, new equipment, because of cost, you'll be interested in reading the free manual offered in the coupon below. An actual case history, it describes methods which improved collections of delinquent taxes so greatly, the necessary new equipment more than paid for itself within the first six months.

1 Effective accounting control over assessed valuations from the time the assessment is made.

2 Complete detail of valuations, exemptions and computations on each tax bill, in contrast to a mere tax notice mailed to the taxpayer.

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You can have any or all of these results...and from a single, responsible source ...Remington Rand. Making, as we do, more than 20,000 office items, we are able to recommend exactly the right combination of methods, machines and equipment to meet your needs economically. Here are quick facts on a few of our many products. Ask our nearest office for details.

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Powered with dependable Briggs & Stratton motors, new positive reel adjustment, new all-steel welded deck, heavily reinforced for added strength and rigidity. These improved Cooper roller type mowers provide the most up-to-date mowing equipment now available for service in parks, cemeteries, golf clubs, public institutions, industrial plants and private schools.

"Imperial" model available with Riding sulky, equipped with low pressure 14x400 balloon tires, weed cutting attachment, and automatic dump grass catcher.

Also available as a 65" Heavy Duty Mower with Triplex Cutting Units and Riding Attachment. Will easily maintain any lawn expanse up to 35 or 40 acres.

Write TODAY for literature and name of nearest distributor

* Manufacturers of QUALITY Power Lawn Mowers Since 1926

COOPER MANUFACTURING CO.

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White Heating Kettles Have Fire-Proof Tops

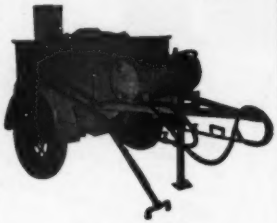
Cut-back and highly inflammable road repair material can be heated safely in White kettles. FIRE-PROOF top reduces fire hazard.

White asphalt and tar kettles are extensively used. They give long life and satisfaction.

Plain kettles or with hand or engine driven spray pumps for patching pavement. Thermometer, barrel hoist, warming hood extra. All oil burning. Semi-elliptic springs, pneumatic tires.

65, 110, 165, 220, 300 gallon capacities.

Model F-10 is oil jacketed, to heat elastic joint filler.



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Leadite is shipped in powder form, packed in sacks of 100 lbs. net each. Leadite tested and used for over 50 years ● Leadite joints improve with age.

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PORTABLE BASE STATION

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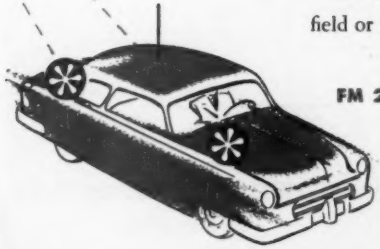

NEW MOTOROLA UNI-CHANNEL SENSICON DISPATCHER with marvelous SENSICON circuit for *permanent selectivity*— and seven other exclusive MOTOROLA developments to give you the finest 2-way radio performance available today...In civil defense or essential industrial applications, have Uni-Channel ready for quick set-up in the field or auxiliary headquarters.

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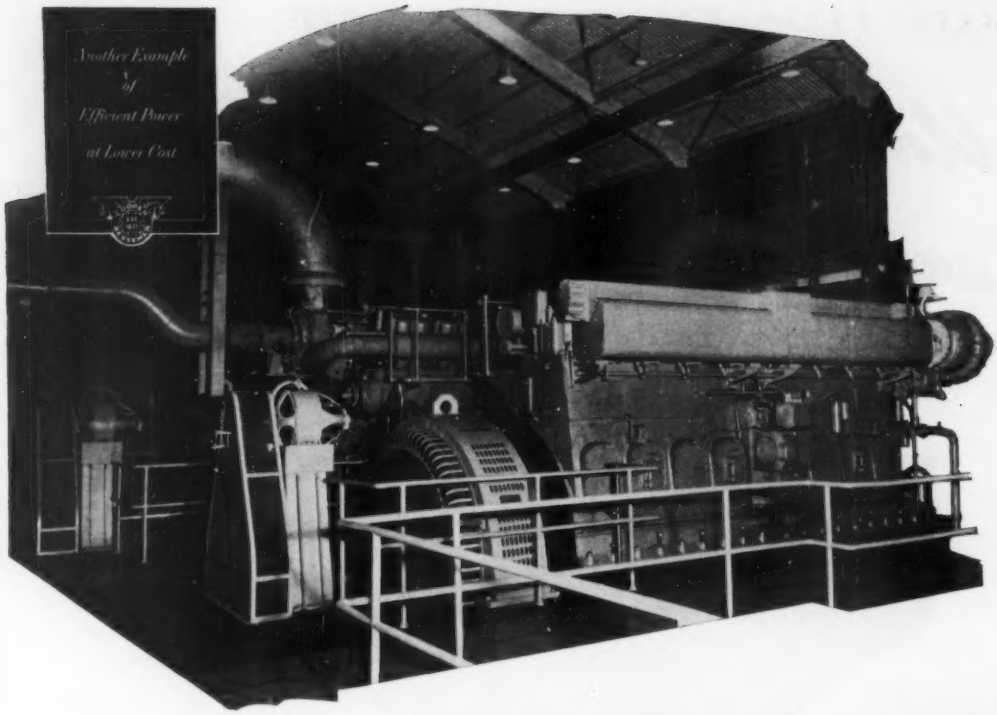

How to trade engine heat for cold cash!

If you're a technical man, you know that an engine simply converts the heat of fuel combustion into usable motion or power. You also know that there's always more or less *unused* heat that must be dissipated or somehow disposed of. In the installation of sizeable engines this becomes a costly problem, involving expensive cooling equipment and valuable space. Here again, recent Cooper-Bessemer developments are saving money. For example, hundreds of big Cooper-Bessemers like those shown above are used in stationary service. Because of Cooper-Bessemer developments such as the gas diesel, gas engine supercharging, and other advancements, much more combustion heat can now go to produce power, leaving much less waste heat to be dissipated. Thus the cost of cooling equipment, piping and installation, is now greatly reduced. It's a huge plus saving over and above the gains of greater fuel economy and increased power.

Far-reaching developments like these are constantly being worked out at Cooper-Bessemer. If you have a stake in power, be sure to find out about the *new* things being done by one of America's *oldest* engine builders.

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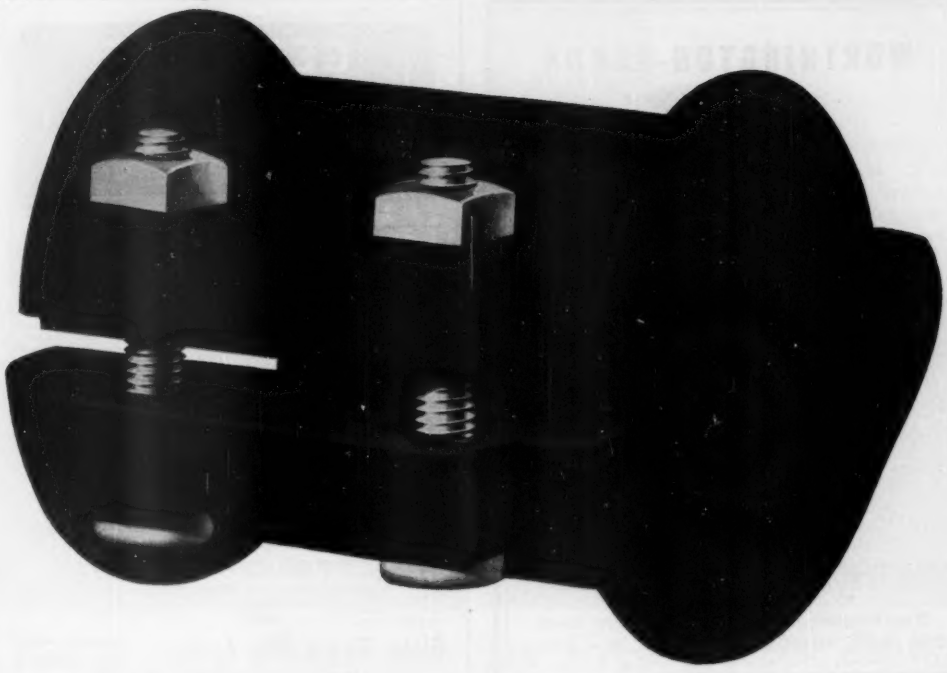

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PIPE LINE CLAMP

During the present critical shortage of pipe, nothing compares with these clamps for repairing corrosion leaks and splits in services as well as mains—for all sizes of steel and cast iron pipe, ½" to 12". Standard of the industry for half a century.

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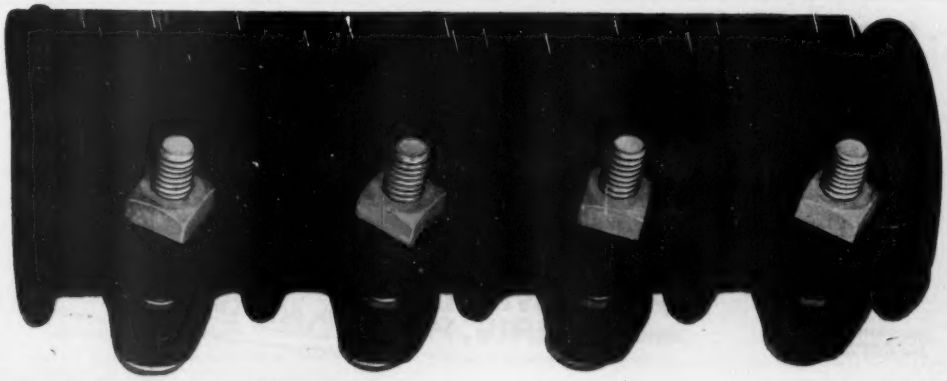
SOUTH BEND 21, INDIANA, U. S. A.



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All Sizes All Types

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GEOPHONE
locates leaks without digging

"Registered in U. S. Patent Office"

When the discs are placed on the ground (as pictured) the Globe Geophone detects by sound the exact location of leaks in water or steam pipes. Acclaimed for its accuracy, the Globe Geophone has become indispensable in Public Works Departments and Industrial Plants throughout the United States.

• **MONEY-SAVING**

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• **ACCURATE**

Operating on the principle of the seismograph, the Globe Geophone is without question the most sensitive and reliable instrument for detecting underground leaks.

Complete Geophone outfit consists of connecting tubes, two Geophone discs, headpiece, and heavy leather-covered carrying case with shoulder strap..... **$85**

Pipe Phone $3.70
(Aquaphone)

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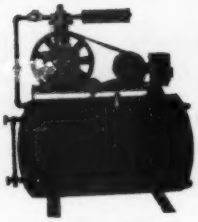

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DAY AND NIGHT VISIBILITY

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E-3-6 — 6 WAY ASSEMBLY
WITH BLACK HOUSINGS

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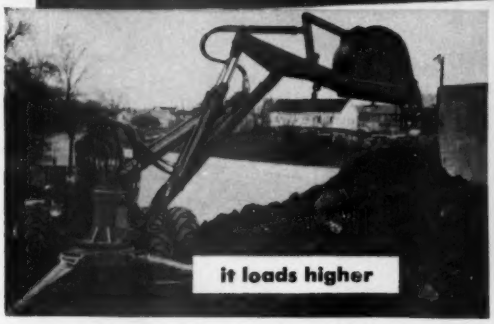
ALUMINUM IS *Scarce!*
TO INSURE DELIVERY OF SIGNS
PLACE ORDERS NOW!

Now... It's even better!

THE OLIVER-WARE Hydro-Trencher

It's Smoother Operating...
No hesitation or "jerks" in the smooth application of hydraulic power. You get smoother, easier handling... more positive control with less operator fatigue.



..and it has a Sensational New "Forced Ejection" Bucket

By simply reversing the bucket and dipper stick, you get a swing loader that loads out material faster than you'd believe possible. "Forced ejection" bucket is available as optional equipment. Standard trencher bucket and standard swing loader bucket are available at slightly lower cost. With standard loader bucket, loading height is 12 feet. Loading height with "forced ejection" bucket is 12½ feet.

The "forced ejection" bucket gives you quick, clean, complete discharge of even the stickiest materials. Bucket gate is hydraulically controlled and travels the complete length of the bucket to "force" out all material.

For complete information on this all-hydraulic, tractor-mounted trencher and swing loader, see your Oliver Industrial Distributor or mail the coupon.

Have you seen the Oliver color movie, "Task Force on Wheels"? Your Oliver Distributor will be happy to arrange a showing.

THE OLIVER CORPORATION

Industrial Division: 19300 Euclid Avenue, Cleveland 17, Ohio

A complete line of Industrial Wheel and Crawler Tractors

The OLIVER Corporation Industrial Division
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Gentlemen: ( ) Send me the facts on the improved Oliver-Ware Hydro-Trencher. ( ) I would like to see the Oliver color film, "TASK FORCE ON WHEELS."

Name.....

Address.....

Company.....

City.....State.....

water, water everywhere...

Sanitation HTH is available in cases of nine handy 5-lb. cans and in 100-lb. drums.

but *None* that's fit to drink

That's what can happen when flash floods overtax your water purification system. But not if you have on hand a substantial stock of Sanitation HTH, the recognized dry chlorine source for emergency stand-by service.

Less dramatic but equally effective is the part Sanitation HTH can play in your everyday chlorination operations. Disinfecting of mains, tanks, basins, filters and reservoirs is made easy... your regular water chlorination program is made more effective.

Anywhere that chlorine action is needed, you can rely on HTH to do the job—and do it well! So don't wait for emergencies before you call on this versatile, free-flowing, stable chlorine source.

Write today for your own copy of "Hypo-Chlorination of Water" and learn about the many uses of Sanitation HTH. Mathieson Chemical Corporation, Mathieson Building, Baltimore 3, Maryland.

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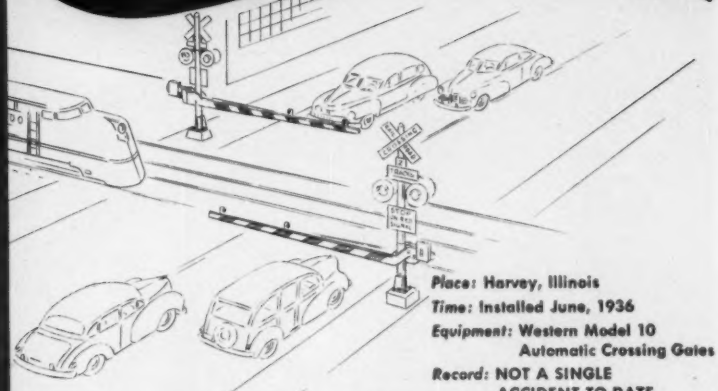
SERVING INDUSTRY, AGRICULTURE AND PUBLIC HEALTH

14 years of uninterrupted service

...and still going strong!



Place: **Harvey, Illinois**
Time: **Installed June, 1936**
Equipment: **Western Model 10 Automatic Crossing Gates**
Record: **NOT A SINGLE ACCIDENT TO DATE**

The *unequalled* reputation for dependability earned by Western Model 10 Automatic Crossing Gates is the result of *actual performance in service*. Case histories such as the above are being made by Model 10's in all parts of the country, under all weather conditions and regardless of light or heavy traffic flow.

In daily use by almost 100 railroads and backed by more than 14 years of "know-how", Western Model 10's provide automatic, round-the-clock DEPENDABLE protection.

When the railroads serving you install Model 10's in your city, it means simply this: YOUR SAFETY has taken precedence over all other considerations! Write for Bulletin 748-AC10 for complete information.

Since Model 10's have been installed at thousands of dangerous railroad-highway crossings, not one fatality has EVER occurred as a result of operation failure!

WESTERN *Model 10*
AUTOMATIC GRADE CROSSING SIGNALS
PRODUCT OF
WRRS
WESTERN RAILROAD SUPPLY COMPANY
CHICAGO 8, ILLINOIS

LEADING MANUFACTURER OF GRADE CROSSING SAFETY DEVICES — MAKER OF RAILWAY SIGNALING ACCESSORIES

STRENGTH is vital

Be doubly sure when you specify pipe for mains to be laid under city pavements. Sure that it effectively resists corrosion. Sure, also, that it has the four strength factors, listed opposite, that pipe must have to withstand beam stresses, external loads, traffic shocks and severe working pressures. *No pipe, deficient in any of these strength factors, should ever be laid in paved streets of cities, towns or villages.* Cast iron water and gas mains, laid over a century ago, are serving in the streets of more than 30 cities in North America. These attested service records prove that cast iron pipe not only assures you of effective resistance to corrosion but all of the vital strength factors of long life and economy.

in pipe for city streets

No pipe that is deficient in any of the following strength factors should ever be laid under paved streets.

CRUSHING STRENGTH

The ability of cast iron pipe to withstand external loads imposed by heavy fill and unusual traffic loads is proved by the Ring Compression Test. Standard 6-inch cast iron pipe withstands a crushing weight of more than 14,000 lbs. per foot.

BEAM STRENGTH

When cast iron pipe is subjected to beam stress caused by soil settlement, or disturbance of soil by other utilities, or resting on an obstruction, tests prove that standard 6-inch cast iron pipe in 10-foot span sustains a load of 15,000 lbs.

SHOCK STRENGTH

The toughness of cast iron pipe which enables it to withstand impact and traffic shocks, as well as the hazards in handling, is demonstrated by the Impact Test. While under hydrostatic pressure and the heavy blows from a 50 pound hammer, standard 6-inch cast iron pipe does not crack until the hammer is dropped 6 times *on the same spot* from progressively increased heights of 6 inches.

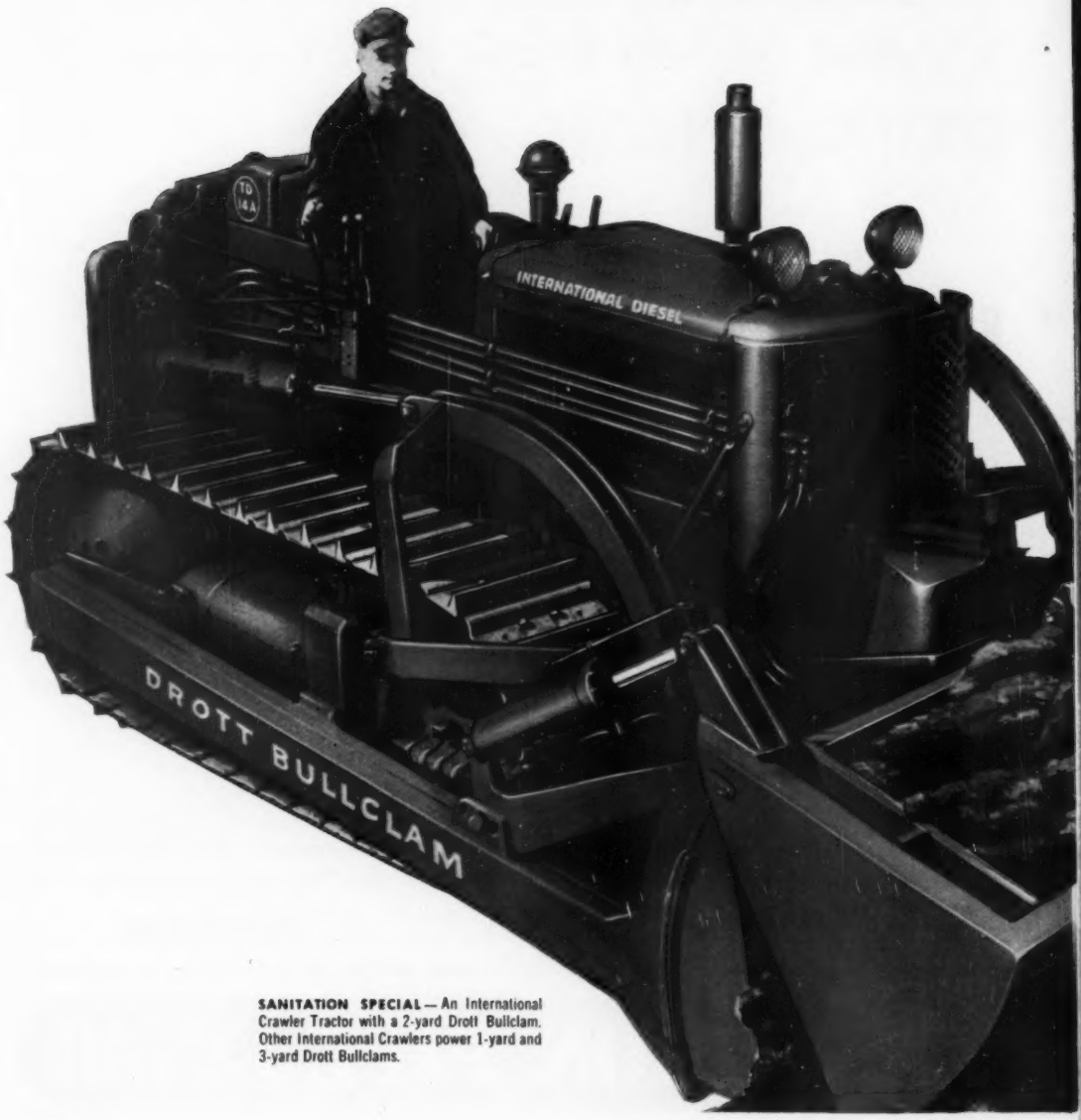
BURSTING STRENGTH

In full length bursting tests standard 6-inch cast iron pipe withstands more than 2500 lbs. per square inch internal hydrostatic pressure, which proves ample ability to resist water-hammer or unusual working pressures.

CAST IRON PIPE RESEARCH ASSOCIATION, THOS. F. WOLFE, MANAGING DIRECTOR, 122 SO. MICHIGAN AVE., CHICAGO 3.

CAST IRON PIPE SERVES FOR CENTURIES

One Man



SANITATION SPECIAL—An International Crawler Tractor with a 2-yard Drott Bullclam. Other International Crawlers power 1-yard and 3-yard Drott Bullclams.

Sanitation Squad

Here's the only one-man unit specifically designed to do all four steps of the complete sanitary fill job!

You save money, you save man-hours when a Bullclam gets at your garbage. One man, one outfit builds a fill that raises land values at the same time it raises the land itself.

This is the ONLY equipment especially built to handle the whole sanitary fill job. The big Bullclam, powered by all the brute force of the rugged International Crawler, digs in, scoops out the excavation, then tackles the refuse as the trucks dump it, crushing, smashing and grinding the bulk, compacting and ironing it with the specially curved Drott Bullclam front.

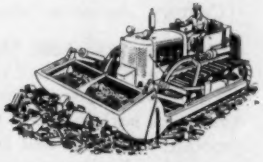
The same unit carries the cover dirt, spreads it in place and grades it off—ready for a playground, airport, ball park or similar municipal use.

Ask your International Industrial Distributor for details. Or write to Drott Manufacturing Corporation, Milwaukee 8, Wisconsin. And remember, the Bullclam saves you cash and time. It does away with open dumps and smoking garbage burners. It's a community asset any way you look at it.

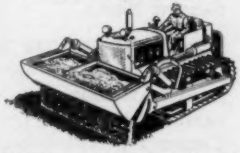
Drott Manufacturing Corporation
Milwaukee 8, Wisconsin

International Harvester Company
Chicago 1, Illinois

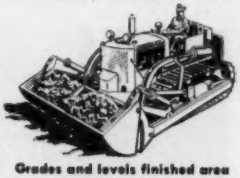
Prepares the site



Crushes and compacts refuse



Transports and spreads earth cover



Grades and levels finished area

BULLCLAM BY

DROTT

POWER BY

INTERNATIONAL

POWER THAT PAYS

The inside story of "Century" ASBESTOS-CEMENT PIPE

BEFORE you specify pipe for water mains, be sure to consider the *inside*, as well as the outside. Here's what you'll find inside "Century" Asbestos-Cement Pipe:

A SMOOTH, CLEAN BORE THAT STAYS THAT WAY! —"Century" Asbestos-Cement Pipe is formed on a smooth, steel mandrel—the pipe's interior takes its surface from this . . . permanently smooth! (Williams and Hazen Constant "C" is conservatively placed at 140 for Asbestos-Cement Pipe.)

A NON-TUBERCULATING SURFACE! —Tuberculation, one of the pipe enemies from within, first increases friction, then reduces flow area. This cannot happen with "Century" Asbestos-Cement Pipe. It is entirely non-metallic. Initial flow capacity remains constant!

Installation crew laying "Century" Pipe through wooded area.

A SURFACE THAT RESISTS CORROSION!—Though corrosion is usually an *external* enemy of pipe, certain combinations of water chemicals, together with electrolysis, can bring about internal pipe corrosion and deterioration. "Century" Asbestos-Cement Pipe is entirely mineral in nature—is immune to electrolysis—resists all corrosion factors, both internal and external!

AND CONSIDER THE OTHER FEATURES OF "CENTURY" ASBESTOS-CEMENT PIPE: "Century" Pipe is exceptionally strong, yet, light in weight. It can be handled easily, laid quickly, without special laying equipment. The "Century" Simplex Couplings are of the same Asbestos and Cement composition as the pipe—permit rapid, easy laying of both straight runs and curves up to 5° deflection per pipe length. And, so permanently strong and unchanging is "Century" Pipe, that it can be recovered and laid in its original pressure class!

BEFORE YOU BUY OR SPECIFY ANY PIPE FOR WATER MAINS, get the complete story on Keasbey & Mattison "Century" Asbestos-Cement Pipe. We'll gladly send details upon request.

Nature made Asbestos...
Keasbey & Mattison
has made it serve mankind since 1873

KEASBEY & MATTISON
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Is Your Fire Department Ready?

The President has declared a State of Emergency. Our military defenses are rapidly expanding. And our weapons against fire must be equally strengthened.

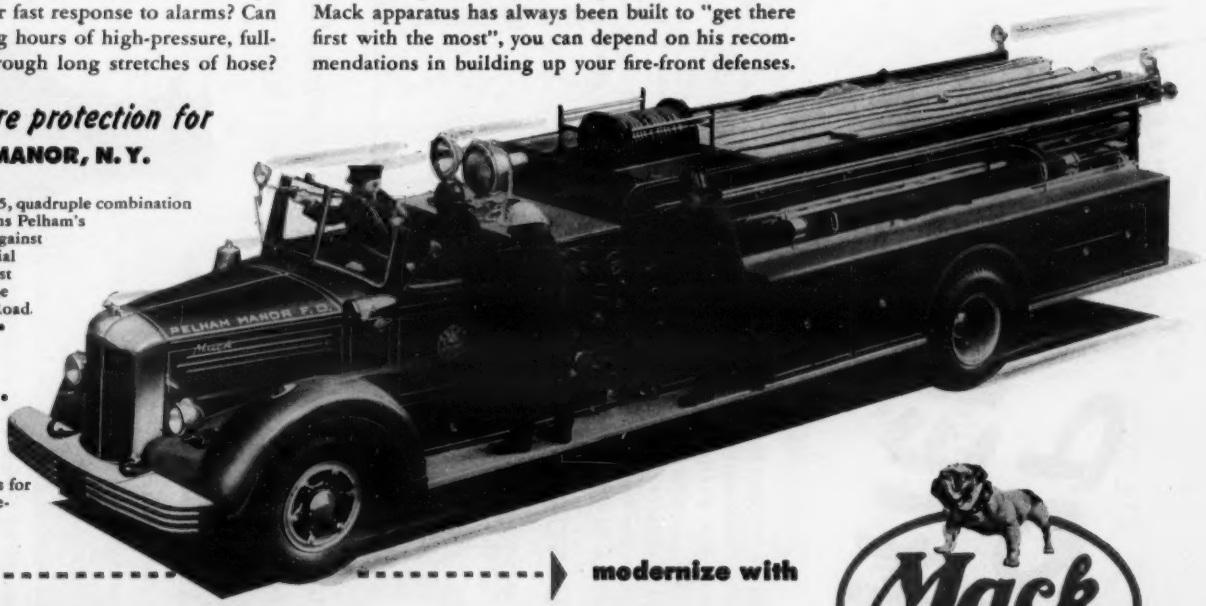
So check *your* apparatus now. Can each unit cope with modern traffic for fast response to alarms? Can each pumper face long hours of high-pressure, full-capacity operation through long stretches of hose?

Do you have plenty of hose-carrying capacity? Are you prepared to wage large-scale battle against *any* type of fire? While time is still on your side, consult with an experienced Mack representative. Because Mack apparatus has always been built to "get there first with the most", you can depend on his recommendations in building up your fire-front defenses.

All-around fire protection for

PELHAM MANOR, N. Y.

This new Mack Type 85, quadruple combination ladder truck strengthens Pelham's protection—not only against residential and industrial hazards, but also against tanker-truck fires on the teeming Boston Post Road. 750 gpm major pump • 250-gallon booster tank • dual-purpose foam and wetwater proportioner • 800 ft. of 2½-in. hose and 500 ft. 1½-in. hose • aluminum ladders • enclosed compartments for portable rescue and fire-fighting equipment



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FIRE APPARATUS

MACK MANUFACTURING CORPORATION
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Factory branches and distributors for service and parts in all principal cities. In Canada: Mack Trucks of Canada, Ltd.

TRIPLE COMBINATION PUMPERS—500 TO 1500 GPM . . . SQUAD AND HOSE CARS . . . AERIAL, CITY SERVICE AND QUADRUPLE COMBINATION LADDER TRUCKS

"STOP THIEF!"

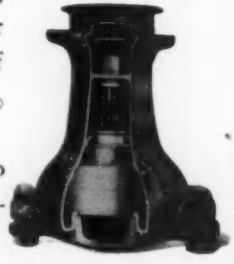
Silent, unsuspected, the overflow pipe has been found by experience to be one of the largest water-wasters, the biggest thief of water revenue. Running over steadily, at low rates of flow, its leakage never registers on meters not maintained in good condition. In such cases, a not unusual leakage of ¼ gallon a minute goes unaccounted and unpaid for—amounting to over 10,000 gallons a month!

Be sure your repaired meters register at least 90% at ¼ gpm

Of unaccounted-for water, possibly more can be attributed to under-registration of meters than to any other single cause

Surveys show that 13% of all water passing through ⅝" meters is used at about ¼ gallon per minute. So you can readily see the importance of having your repaired meters register at least 90% at that rate of flow.

Your Trident representative will be glad to give you the benefit of his experience in connection with modern meter shop operation.



New improved parts in old Trident Meter

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Branch Offices in Atlanta, Boston, Chicago, Dallas, Denver, Los Angeles, Louisville, North Kansas City, Portland, Ore., San Francisco.
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River-Basin Basis Recommended For Water Resources Development

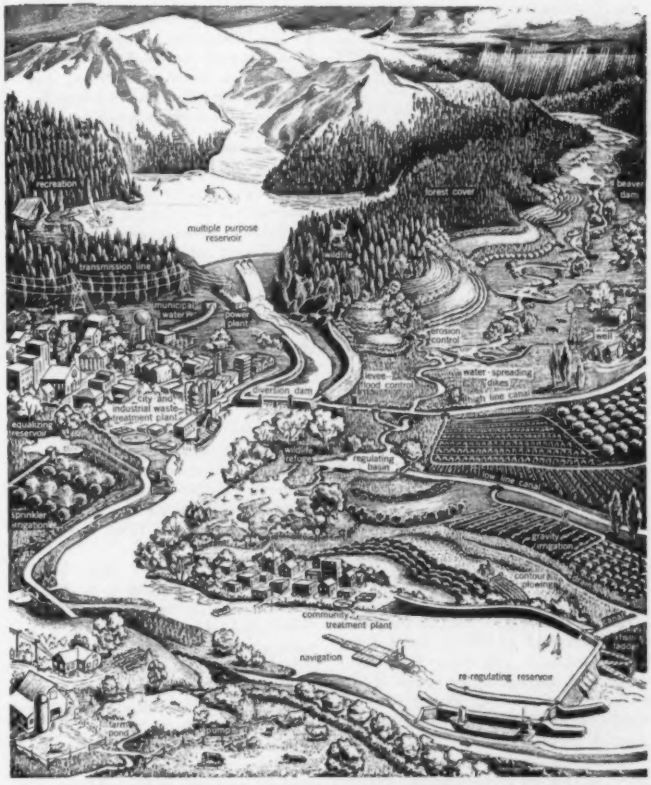
THE NATION'S water resources should be developed on a river-basin basis. This seems to be the fundamental recommendation of the President's Water Resources Policy Commission. The report, a 450-page treatise, was delivered December 1950 and is the first of three that the Commission plans.

The report argues that using a river basin to the best advantage generally requires the building of multiple-purpose dams. These, the Commissioners stated, should be constructed with federal funds. No other agency, they feel, can command the capital necessary. The report explains that this does not mean that the Federal Government is supplanting private enterprise. In contrast, the Commissioners feel that this governmental step will provide conditions for further expansion and healthy functioning of a free, competitive economy.

Basin-Use Payment

The basin facilities should require payment by those who enjoy it, the report recommends. It advises further, however, that the facilities contribute to the general welfare of the nation. Thus, the Commissioners recommend that the Government assume a portion of the cost.

The recommendations of the Commissioners lean heavily on federal participation in any basin development. They advise that the Congress should direct the responsible federal agencies to cooperate with each other and appropriate state agencies in the necessary surveys and plans. They also suggest that federal departments and independent agencies participate in river-basin commissions. The Commission asks that the Congress direct all federal agencies to apply the same standards and methods to the evaluation of all river-basin programs. It asks further that a federal board of review be appointed by the President with the confirmation of the Senate to perform, among other things, the functions of review agencies recom-



The President's Commission visualizes the proper utilization of a river basin.

The President's Water Resources Policy Commission urges use of multi-purpose dams for hydro-electric power, water supply, shipping, and irrigation; states that water supply should be a local responsibility, and sets a 10-year period for a pollution-abatement program

mended in the report of the Hoover Commission.

As reimbursement to the proposed basin organization, the Commission recommends that for domestic and industrial water supply, and for hydroelectric power, it should provide for full repayment of water supply or power costs, including operation and maintenance, repayment with interest of an appropriate allocation of the program investment, and payment in lieu of local and state taxes that would have been paid on acquired properties.

Repayment for drainage, irrigation, and watershed management, the Commission feels, should be based on ability to pay, with no interest charged. The payment should be measured by the resulting increase in the land operator's net earnings.

For navigation, it should be determined in connection with a general program for putting charges for all forms of transportation on a cost basis, including interest.

The Commission asks that the Government encourage enactment of state laws and negotiation of interstate compacts that foster good water management. Flood control and groundwater resources should be considered as part of the program, it states. It asks that the Congress instruct responsible federal agencies to review river basins' programs and consider flood protection, flood storage, and utilization of flood waters.

Land-Use Recommendations

The Commission makes substantial recommendations for water resources and land use. Among them are the extensions of federal credit at reasonable interest rates for the farmers' investment in structures, equipment, fertilizer, stock and seed, and the technical training and guidance of settlers. It endorses the principle—and urges its extension—that the benefits of federal financial assistance through irrigation projects should go only to family-sized farms, together with other anti-speculation and anti-monopoly provisions. It endorses the principle that a 160-acre limitation on farmlands should be considered maximum.

In regions where water will be supplied to existing farms exceeding acreage limitation, the Commission recommends that the water should be supplied under a utility-type contract. These contracts should be based on the full cost of supplying water to such lands, including amortization, with interest of the full investment allocable to this purpose.

Municipal water supplies, the report advises, should continue to be a local responsibility, including the formation of metropolitan water districts. The possibility of contributing to municipal and industrial water supply and irrigation through recharging of groundwater reservoirs was also recommended.

The Commission asks that a 10-year period be set to complete a reasonable program of pollution abatement. It recommends that federal loans be made available at interest rates not exceeding 2% to cover the entire cost. Waterway development, the report urges, should not be tied to railway charges, nor should railroads be allowed to establish discriminatory rates when the lines parallel waterways.

Planning the American Way

"It cannot be too strongly emphasized," says this report, "that planning, for the United States, must mean not rigidity, but intelligent flexibility; not dictatorship and centralization, but cooperative and shared responsibility. The American system succeeds only as it encourages initiative, enterprise, and a sense of responsibility for the common good. No 'plan' can be acceptable which weakens or fails to use these qualities."

Regarding the use of hydroelectric power, the Commission recommends that full use of private power facilities should be established to market the federally produced power. The contracts, however, should preserve the preferential rights of public bodies and cooperatives to share in the power at the lowest possible rates, the report urges.

Regarding fish and wild life resources, the Commission asks that federal participation be determined in relation to federal participation in other recreation programs. The Commission asks that Congress authorize a study of the whole recreation field, having as its objective the development of a national recreational policy.

The Commission also recommends that the Government undertake certain research problems that would:

(a) Explore and develop the necessary techniques for utilizing the nation's groundwater resources.
(b) Establish a sound national policy for the control of artificial rain-making activities.
(c) Explore and conduct pilot-plant operation in the general field of conversion of sea water to fresh water on an experimental basis.

The Commission's statistics regarding public water supplies provide some interesting figures. They state, for example, that the cost of water works averages about $60 per person, but in cities importing their water from great distances, the cost may be twice as much. Cost increases in recent years probably have run the new-construction average cost to figures of probably $100 to $125 per person.

The annual domestic water charges in the United States average only $6 per person, the report records. In general, domestic water is procured, filtered, pumped, and distributed at a cost of less than 5 cents a ton. While the capital cost of providing for fire protection may represent 25 to 40% of the cost of the water works, the quantity of water used annually for fire purposes is small. In large systems it is insignificant.

The Commission quotes figures from the U. S. Geological Survey showing the following water use, which accounts for 14% of the nation's yearly run-off to the oceans:

(*All figures in billion gallons per day*)

	From ground water	*From streams and lakes*	*Total*
Irrigation	15	80	95
Industrial	5	65	70
Municipal	3	9	12
Rural (other than irrigation)	2	1	3
Total	25	155	180

The report calls attention to the fact that sea water has been made into water suitable for drinking for many years. However, in its present state of development, it is a high-cost method, wasteful of the nation's energy resources.

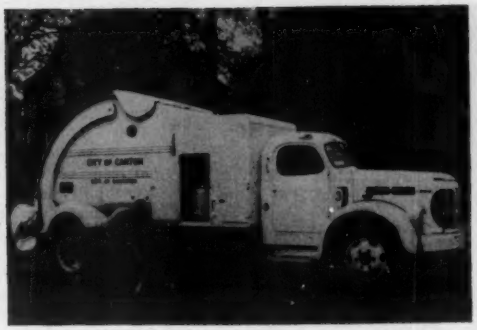
Personnel of the President's Commission

The report was written by six men who formed the Commission. These included: Morris L. Cooke, Chairman; Gilbert F. White, Vice-Chairman; Paul S. Burgess; Lewis Webster Jones, Samuel B. Morris, Leland Olds, and Roland R. Renne.

Mr. Cooke is a Philadelphia consulting engineer. Dr. White is a geographer and President of Haverford College. Mr. Burgess is Dean of Agriculture, University of Arizona. Dr. Jones is an economist and President of the University of Arkansas. Leland Olds is a former member of the Federal Power Commission. Mr. Morris is General Manager and Chief Engineer of the Los Angeles Department of Water and Power. Mr. Renne is President of Montana State College.

See editorial comment on page 5. Also review, on page 149, of *A Water Policy for the American People*, Vol. I.

The can is sterilized after being emptied. Right-hand compartment is for thawing cans in freezing weather.



The cleaning water is used once, then is caught in a slop tank, which is emptied periodically into the sewer.

GARBAGE CANS

Washed on the Spot

Canton, Ohio, puts a steam cleaner on the chassis of a closed refuse truck

By A. E. RANSOM, *Superintendent of Water Canton, Ohio*

DEVELOPING an entirely new concept of sanitary garbage-collection procedure, the city of Canton, Ohio, believes it has the most modern, sanitary, and efficient system of any American city.

When Canton began municipal garbage-collection, the city chose not to use general tax money for operating the system. Each subscriber pays 75 cents a month for the service, which has always included a clean, washed can at every collection.

Platform Truck Outmoded

Originally, collected cans were hauled to a farm and the cans cleaned under contract at heavy expense. Twelve double-platform trucks with a capacity of 100 cans per trip gathered the cans and left clean ones in their place. Two-man crews averaged three trips a day, or 150 cans per man per day.

The late C. C. Hommon, Canton's Sanitary Engineer, visualized a more efficient and sanitary garbage-disposal system. In seeking ways to trim costs and improve service, he found that the average can contained only 15 pounds of garbage, which meant that a full truckload of cans contained only 1,500 pounds of garbage. The obvious way to reduce this waste of hauling capacity was to change to covered, sanitary truck bodies and empty the cans right at the collection site.

Studies conducted with the help of E. W. Galloway, of the consulting engineering firm of Alvord, Burdick and Howson, Chicago, indicated that eight of the new units could easily do the work of the 12 trucks already in service. But right here is where the plan ran into difficulties.

The only way they could continue to provide clean cans under the proposed system was to wash the cans as they were collected. This seemed simple enough until they discovered that they had developed an entirely new concept of garbage collection and that there was naturally no equipment on the market to handle the cleaning problem.

Having seen a Hypressure Jenny steam cleaner at work in the city garage, Mr. Hommon tackled the can-cleaning problem by calling in engineers from the Homestead Valve Manufacturing Company, makers of the unit. They quickly adapted one of their production-line models to provide a scalding hot spray for cleaning and sterilizing the cans as they are collected.

Built Experimental Unit

To try the new system in actual use, Canton sewage-department employees and Homestead engineers built an experimental garbage-collection unit. Tests conducted during more than a year of operation proved so satisfactory that eight more units were purchased in order to make a complete change-over to the new system. All of these trucks are now in service.

Seven of the new vehicles have a standard 8½-cubic-yard Leach refuse body on a Reo chassis. One is mounted on a Dodge chassis, but between the cab and the body is a large rectangular housing containing the gasoline-engine-driven steam cleaner, tanks for the necessary water and kerosene, and cleaning and thawing compartments.

As the cans are collected, garbage is dumped into the self-emptying scoop at the rear of the truck. The emptied can is then inverted over a series of jets in the cleaning compartment and the scalding hot spray turned on for about 10 seconds. In freezing weather, cans are set upright in the thawing compartment and heated by the steam spray until the frozen contents have melted enough to slide out when dumped. Thawing takes 10 seconds or less.

Water in the cleaning and thawing compartments is used only once. It is caught in a tank underneath, which is emptied as required. When the slop tank becomes full, the truck pulls over a sanitary sewer drain; the discharge pipe is swung downward; in a matter of seconds the tank is empty, and the truck is on its way.

A crew of three men operate each truck, collecting and washing more than 450 cans per trip. Garbage is now disposed of in a sanitary fill until the new sewage-disposal plant is built.

Economies of the system are obvious. Elimination of the entire cost of the can-cleaning contract, plus a one-third reduction in the number of trucks, with each truck traveling fewer miles than formerly, are responsible for some of the savings, which are expected to total over $25,000 yearly.

In addition to the monetary savings, it is hoped that the new system will be a material step toward increasing the effectiveness of the city's disease-prevention efforts.

The Midwest Digs Out

How community-wide action helped many cities solve the serious problem of last November's record snows

THE late November blizzards that swept from the Atlantic to the Mississippi Valley and beyond blanketed the countryside with towering drifts and choked city streets with impassable barriers of ice and snow. They also pointed up sharply the need for up-to-date snow-removal programs in many of the Midwest's largest and most progressive communities.

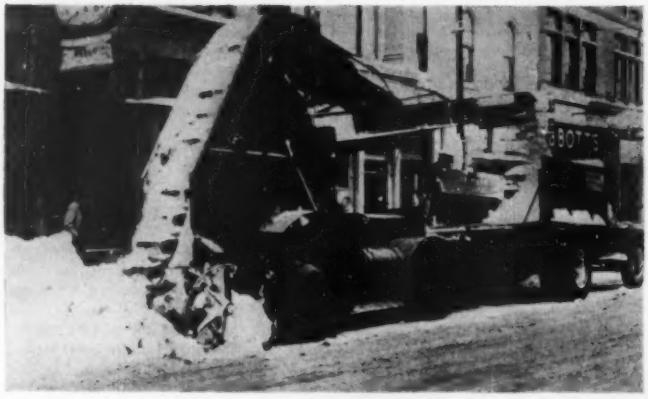
In some localities, only prompt cooperation on the part of citizens' groups, military authorities, civic officials, contractors, truckers, and other operators of material-handling and earth-moving equipment permitted clearing streets in time to avert fire disaster, to prevent extensive looting and other lawbreaking, and to permit deliveries of milk and other food essentials.

In Ohio, communities which had never, within memory, suffered more than minor annoyances from winter's snows found themselves unable to move. In Cleveland, Regular Army and National Guard tank and engineer units were mobilized on an emergency footing to break the drifts and prepare windrows for truck-loading by means of conventional—and some decidedly unconventional—snow-loading equipment.

Those communities which had prepared for normal snow-removal requirements found their equipment taxed to the maximum. In Lorain, Ohio, a Barber-Greene Model 522 snow loader teamed with other equipment and loaded a total of 382 five-yard trucks in one day (Sunday, November 26). Through an assist received from another B/G machine owned by a local contracting company, Lorain was able to resume vital supply and protection services within two days, despite 12 to 20 inches of snowfall and drifts which, in places, reached 12-foot depth.

In Cleveland, dozens of equipment dealers stripped their yards and warehouses of all types of truck-loading equipment.

Likewise faced with a critical tie-up, the New York Central Railroad was fortunate in having two giant Barber-Greene railway snow-melter units on hand. One of the units was applied to clearing the Collinwood switching



To help clear the streets of Wapakoneta, Ohio, after the big snowstorms, the Wapak Sand and Gravel Company sent a bucket loader from its near-by pits. A similar machine was sent to Lima, Ohio, several miles distant, to assist evil-defense workers in digging out that snow-trapped city.

Left: **Lloyd H. Markel, Mayor of Aurora, Ill., operates his city's snow loader on a downtown street. After regular street crews became exhausted fighting the aftermath of late November blizzards, Mayor Markel, city officials, councilmen, and other municipal employees took over the grading, loading, and driving of trucks.** ***Above:*** **With plenty of snow to work on, the City of Lorain's snow loader was able to fill 382 trucks in a single day.**

yards in Cleveland; the other worked in the Rockport yards.

With city street crews exhausted by double and triple shifts, the Mayor and City Councilmen of Aurora, Ill., took over the operation of their city-owned Barber-Greene snow loader, which fortunately had been delivered on the day the storm struck.

Sparking many municipal governments into action against tie-ups of traffic due to snow was the partial loss of parking-meter revenue. In one test community of 60,000, where about 1,000 meters are installed, revenues dropped 20 to 25% from the first day of heavy (and unremoved) snow, and continued until streets were cleared.

Demands for clean curb-parking areas are frequently made by merchants' groups. An excellent example of this promotion can be found in Pella, Iowa. Although Pella has a population of only 4,414, it has operated a Barber-Greene snow loader for two years. The main retailing street in Pella is also a main highway. State maintenance crews cleared the highway promptly after each storm, but left the roadside parking areas too deep in snow for parking. The reduced revenue which the merchants suffered as a result of this caused them to lodge protests with the city government, to the end that adequate snow-removal equipment was procured.

Bergen County Planning Board Sponsors Highly Successful Municipal Seminars

RECOGNIZING that a well-informed public is vital to the success of any planning program, the Bergen County (N. J.) Planning Board, since last October, has been calling in experts from every branch of the field to bring the subject before the county's 70 municipalities. A 10-meeting seminar sponsored in association with the Bergen County Board of Chosen Freeholders and the County Park Commission, members of which also participated in the conduct of the sessions, was directed particularly to members of local planning and zoning boards, as well as to those on municipal governing bodies. Invitations to attend were extended also to the general public, and many attended the admission-free discussions.

Announcement of the seminar was widely hailed in the county's daily and weekly press as something long needed, and newspapers gave much space to covering the sessions as well as publishing advance notices of coming programs. Extensive public interest was evidenced by regular attendance by representatives of more than 90% of the county's municipalities, and by the number and variety of queries submitted during the question-and-answer periods, a feature which proved the highlight of many of the meetings.

The subjects treated were selected with a view to providing a broad coverage of the underlying principles of municipal and county planning, and also afforded an opportunity for detailed discussion and expert advice on specific situations reported by members of the audience.

Hewing closely to the outline mapped by the seminar's originators, the sessions were addressed by planners, consultants, government officials, and experts of national reputation, as well as those particularly familiar with local conditions. Transcriptions of the talks and discussions were made by wire recording for future reference use. This was the 10-week program:

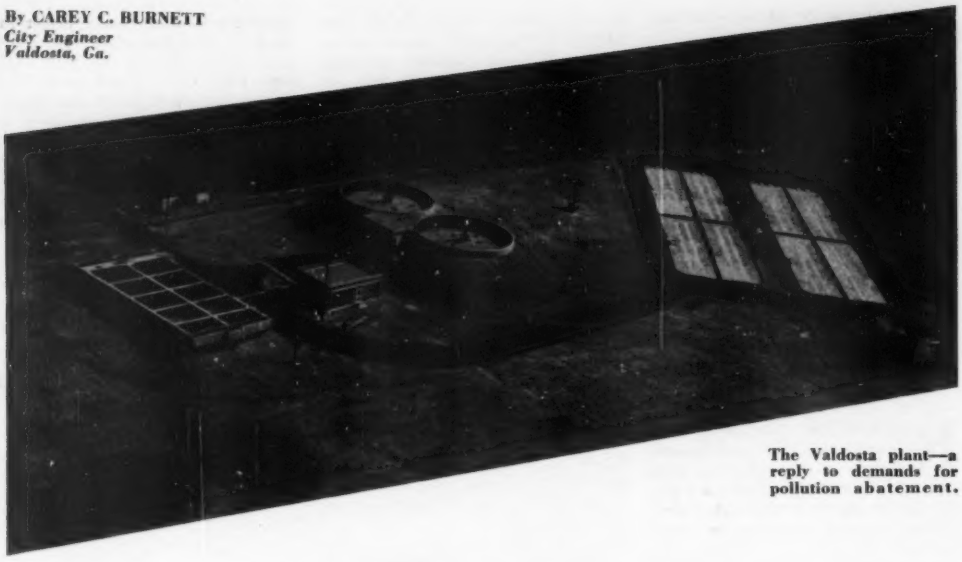
- Session 1—*Introduction to Planning*
  - (a) Why this series of meetings is being held
  - (b) The approach to planning
  - (c) Planning our communities
- Session 2—*Zoning*
  - (a) Its use in preserving realty values and maintaining a town's desired functions and character
  - (b) Powers and duties of zoning boards of adjustment (State of New Jersey)
  - (c) The professional planner looks at zoning
- Session 3—*Traffic and Parking Problems*
  - (a) Traffic and traffic control
  - (b) Municipal parking problems *can* be solved
  - (c) Highways for New Jersey (parkways, freeways, major highways)
- Session 4—*Enabling Legislation*
  - (a) Legal tools for the planner
  - (b) Courts' decisions on zoning and planning in New Jersey
  - (c) The Planning and Zoning Act of New Jersey
- Session 5—*Building a Master Plan*
  - (a) Basic studies
  - (b) Industrial locations
  - (c) Subdivision design and control
- Session 6—*Parks and Recreation*
  - (a) Parks and recreation areas
  - (b) Experience in park and recreational work
  - (c) Modern trends in park planning and development
- Session 7—*Public Health and Safety*
  - (a) Sociological planning and environmental sociology
  - (b) Building codes
  - (c) Garbage disposal, sanitary sewers, and pollution
- Session 8—*Municipal, County, and Regional Planning*
  - (a) The autonomy of the municipality
  - (b) Planning boards as coordinating agencies
  - (c) Urban redevelopment—its relationship to regional planning
- Session 9—*Municipal Financial Policy*
  - (a) Assessments and tax rates
  - (b) Financial operation of a municipality
  - (c) Municipal debt limit
- Session 10—*Public Relations*
  - (a) The logic of a well-informed public
  - (b) Citizens' education and support for development
  - (c) The planning board's responsibility to a municipality

Information in the form of maps, data sheets, reprints of articles, and copies of reports issued by the County Planning Board, pertinent to the evening's discussions, were distributed at each seminar session. An object of this distribution was to give the public a better idea of the variety of information available in the offices of the Planning Board at Hackensack.

So marked was the interest in the 1950-51 Seminar, and so wide was the representation in attendance, that the County Planning Board is now seriously considering additional public meetings of a similar nature, says Henry O. Pond, of Tenafly, former County Planning Board chairman, and director of the seminar arrangements. "Professional planners realize," explained Mr. Pond, "that while well-considered plans are essential, no action can be had without public acceptance and support. It is axiomatic that such support is not possible without a well-informed public."

Others who formed the special committee on seminar arrangements were: Stuart D. Currier, Executive Director of the Bergen County Park Commisssion, and formerly associated with the Bergen County Planning Board; C. Earl Morrow, of the Regional Plan Association, Inc., of New York, consultants to the Bergen County Planning Board; and George H. Dieckmann, staff representative of the Bergen County Planning Board.

By CAREY C. BURNETT
City Engineer
Valdosta, Ga.



The Valdosta plant—a reply to demands for pollution abatement.

It Simply HAD *to Be Done*

"Some are born great, some achieve greatness, and some have greatness thrust upon them."—Shakespeare.

THE same may be said of cities and their sewage-treatment plants —in the experience of this writer, however, it seems that most fall into the third category. They have sewage treatment "thrust upon them."

In no way is this meant to belittle the municipalities that build these important sanitary improvements, but this sums up the facts realistically. Sewage-treatment facilities cost money—much money—and money is the one article most cities find in short supply. Valdosta is certainly no exception.

The reason for this "dollar shortage" is simple. First, Valdosta had to rebuild and catch up with an antiquated sewage and water system 25 years behind the times. Half of Valdosta's residential area was without sewerage facilities, and 35% without water lines. To serve these areas adequately with water and sewerage would take an astronomical sum of money for a city of 20,000—$2,000,000. That kind of money comes very slowly, and not from taxes.

The general belief among all citizens is that cities live by their taxes. Nothing could be further from the truth. Valdosta's general government receives $150,000 per year from property taxes. The yearly expense of Valdosta's general government is $420,000. This leaves $270,000 to be raised by business licenses, parking meters, fines and forfeitures, building permits, cemetery sales, etc. It's a nip-and-tuck fight each year, and city councilmen are hardly to be blamed for placing sewage treatment at the tail-end of the priority list even when there are homes within the city limits that do not even have running water or sanitary toilets.

Annexation Complications

But a city's responsibility does not end with its city limits. Sometimes the people in the country are just as interested in cleaning up as the city people are. In Valdosta, the problem piled itself right on top of the City Council's already overloaded agenda with a petition signed by 35 residents from small communities down the river from Valdosta demanding immediate action to correct the menace and abate the nuisance caused by raw sewage from the city's main outfall sewer, which dumped directly into the Withlacoochee River. This was followed up by numerous "Letters to the Editor" about dead fish found floating in the river, and was climaxed by the following Resolution passed by the Lowndes County Board of Health after numbers of irate county citizens had appeared before the County Commissioners and the Board of Health demanding action. The Resolution read:

WHEREAS: Sewage, acids, and other foreign matter are polluting streams in Lowndes County and are dangerous and injurious to human life, and

WHEREAS: Such pollution is regarded by the Lowndes County Board of Health as a menace to the health of the people of Lowndes County, and

WHEREAS: Conditions resulting from these practices produce breeding places for disease, now therefore

BE IT RESOLVED: That the Board urges all industrial firms and concerns in the City of Valdosta to refrain from the outmoded practice of dumping raw sewage and other refuse in these streams, and

BE IT FURTHER RESOLVED: That all efforts be made by the City Authorities to complete the construction of a Sewage Disposal Plant as rapidly as possble.

(Signed) *Lowndes County Board of Health.*

August 10, 1949

The first reaction of the City Council was that it just couldn't be done. There just wasn't any way to finance a sewage-treatment plant on top of all the other

Valdosta, Ga., responds to the demands of downstream communities by building sewage-treatment facilities and finding a way to finance them

things that had to be done, Resolution or no Resolution.

But honest determination, plus the urgency of the situation, finally found a way. A sewage-treatment plant earns no money and therefore can raise none, but adequate sewerage is a necessity for every home. So it was decided to place a sewer-service charge on every building attached to the city's sewers. The charge was to be 50% of the water bill with a maximum of $1.50 for the residential user and $15 for the industrial user. It was estimated that this charge would bring in approximately $3,800 per month, and revenue certificates were sold on this basis.

Plans Prepared

Smith & Gillespie, Engineers, of Jacksonville, Fla., were hired to draw plans and specifications, and Valdosta began to cast about for a suitable site. The most logical spot chosen by the engineers was about a mile west of town at a point where the city's two main trunklines converged into one large 21-inch outfall to be carried out to the river. This site was very near the small cotton-mill village of Remerton, Ga., which also added its sewage to the outfall. The mill owned the land the city desired for a plant site, and since the mill sewage was also a public-health problem, a plan was worked out with the mill owners whereby the city would be given a deed to the plant site land-free, provided the city would treat the mill-village sewage at the city's treatment plant. The writer, having experienced arrangements such as this in other cities, quickly made a survey of the number of toilets in the village and the quantity and nature of the mill waste.

With the help of the City Attorney, a deed was drawn up which specified the number of toilets and the nature of the waste to be treated, and provided that a charge of 5 cents per thousand gallons of sewage would be placed on the sewage coming from the mill town.

Plant Details

Bids were received, and a contract was awarded to the S. J. Curry Company, of Albany, Ga., for $221,000, for the complete plant including main pump station, clarifier, sludge digesters, sludge-drying beds, controls building, Parshall flume, mill-sewage flow meter, and operations building complete with all laboratory supplies and tools. The contract also included landscaping, grassing, paving drives with double-surface asphalt treatment, and completely enclosing the area with a cyclone fence.

Work proceeded without delay and on November 9 the first sewage went through the plant, bringing to an end a major stream-pollution problem which had begun in 1898 when the large Withlacoochee River outfall was constructed.

The plant, as constructed, is designed for a population of 25,000 according to Georgia Public Health Department standards for primary sewage treatment, which calls for a 2-hour retention period for primary clarifiers, 3 cubic feet per capita for sludge-digestion tanks, and 1 square foot per capita for sludge-drying-bed space.

Actually, the primary clarifier has a 3-hour retention capacity and sludge-digestion tanks are supplied with a P.F.T. recirculating sludge-type heat exchanger which should increase the digestion time 30%, making the plant capacity closer to that needed for a population of 35,000.

The primary clarifier is equipped with Walker Process sludge-collector flights and P.F.T. telescopic-type sludge hopper valves.

The two digesters have Marlow plunger sludge pumps, each capable of handling 150 gpm. Each tank has a P.F.T. floating cover with gas-collection chamber and automatic supernatant draw-off selector. The heat exchanger is a P.F.T. capable of producing 375,000 Btu per hour, and is equipped with a Fairbanks-Morse 150-gpm centrifugal recirculation pump wired to start automatically when the sludge pumps are started.

Flexible Digestion Arrangement

The piping and pump arrangement in the digester-control building is so placed that practically any combination of operation can be achieved, including recirculation if desired. The piping is painted in bright colors of red, yellow, green, and purple, designating raw sludge, digested sludge, recirculated sludge, and supernatant liquids to facilitate the operation of each state. All valves are Nordstrom lubricated plug valves.

The main effluent line passes through a Parshall flume equipped with a Republic recording-transmitter flow meter which is mounted on the laboratory wall in the operations building.

The chlorination equipment consists of a 400-pound Wallace and Tiernan unit with provision also for manually controlled pre-chlorination, and automatically controlled post-chlorination operating from the Parshall flume.

Rails, crane, and chainfall are provided for handling ton containers of chlorine.

Lift Station

The main lift station also houses the grit chamber and bar screens and is equipped with three 1,300-gpm Fairbanks-Morse centrifugal sewage pumps. This pump station also houses the recording devices for the Simplex flow meter installed on the Remerton cotton-mill sewer just before it enters the main-diversion manhole.

The sludge-drying beds are provided with concrete ramps to enable trucks to drive right out on the beds to receive dried sludge for removal.

The operations building is equipped with hot-water radiant heating operating from the P.F.T. heat exchanger.

Also in the operations building is a complete laboratory for running suspended solids, dissolved solids, and BOD and pH analysis.

Operation figures for a plant so recently built cannot be conclusive, but all indications point to efficient, satisfactory primary treatment with a treated effluent meeting all public-health requirements. It should result in quieting the demands of our downstream neighbors to rectify the foul condition of the Withlacoochee River.

A close-up of the primary settling basins.

Machine-Written Central Payroll

—prepared for 2,400 city employees by three persons with office machines

By R. T. NICHOL
Administrative Assistant
Office of the City Manager
Norfolk, Va.

The Underwood Sundstrand payroll machine computes the Norfolk payroll and prepares employee-earnings record-cards and pay checks.

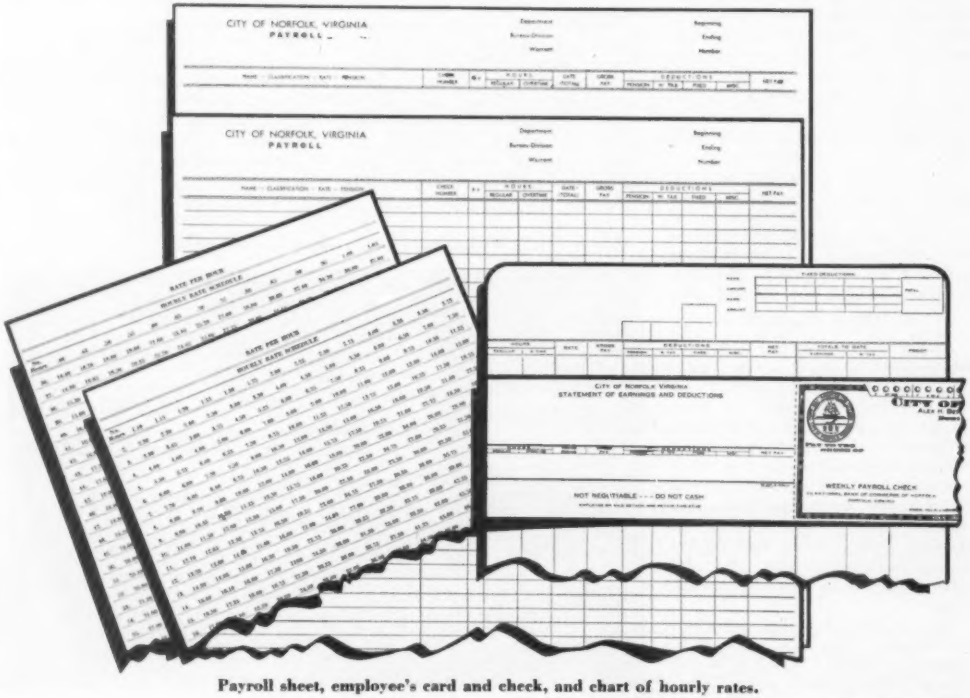
NORFOLK'S population is now 188,601 compared with 144,332 in 1940. Its city payroll of 2,400 employees is handled semi-monthly for salaries, and weekly for wages, by one supervisor, two payroll clerks, and five office machines.

Before each payday—for instance, on the 4th and 19th of each month for salaried employees—rough payrolls for all the bureaus are made up by the payroll unit, using Addressograph equipment. The information thus printed consists of name, address, classification, pay rate, pension rate, number of dependents, department, and bureau.

Each of these basic drafts is sent to the bureau to which it applies. The bureau enters the time worked and multiplies by the pay rate. These payroll drafts, in triplicate, are then totaled and signed by bureau and department heads. While we feel that the central payroll unit and not the bureaus ought to extend the wages, the City Charter requires this local extension.

The original and a carbon of these payrolls go to the City Auditor, who certifies that funds are available. The second carbon is kept by the bureau. The Auditor retains the original copy, the first carbon going to the payroll unit for preparation of the finished payroll in quadruplicate. The first step in producing the finished or "smooth" payroll is to print the same Addressograph information, plus putting the names on the checks.

The gross pay and the payroll deductions are placed on this official payroll, on the check stubs, and on the indi-



Payroll sheet, employee's card and check, and chart of hourly rates.

vidual employee-earning cards by an Underwood Sundstrand payroll machine. The computations are made by reference to the rough payrolls and earning-records cards. The machine automatically calculates net pay. Other machines used are a calculator and an Underwood large-carriage typewriter and adding machine.

For each bureau, the payroll unit proves the finished payroll against the rough payroll, proves deductions against deduction-control cards, and runs an adding-machine tape on the checks in order to prove the net total shown on the payroll. As each department payroll is completed, the payroll unit makes a "recap" in quadruplicate of the entire department and a check for each of the deduction accounts. Departmental recap and finished payroll go to the Auditor, who issues a warrant to the City Treasurer covering the department gross pay. The other copies are sent to the Treasurer and to the Retirement Secretary, the original copy of recap and payroll remaining in the payroll unit.

The payroll unit delivers the pay checks to the Treasurer the day before payday. The Treasurer machine-signs the checks, and bureau representatives pick them up on the 15th and 30th of each month for salaried employees, and on each Friday for hourly employees.

Progressive Standards for Garden Apartments In Boston Area

To the Editor of THE AMERICAN CITY:

WE HAVE found the article on "Standards for Garden Apartments," which appeared in the December issue of THE AMERICAN CITY, very useful and interesting. Our experience in the Boston area is not unlike that which you present for New York, although the sample of places which have any reference to "garden apartments" is much smaller.

In Concord, for example, the limitations include 2½ stories, eight units per building, and 3,500 square feet per family; in Newton, and two or three other suburbs, the limitations are 2½ stories, and 3,000 square feet per family (as is the case in West Hartford and Manchester, Conn.); in addition Lexington just put through a step-rate density control allowing 3,500 square feet per family for two sleeping-room units, 4,000 for three sleeping-room units, and 4,500 for four sleeping-room units.

I would very much like to see published in either the *Journal of the American Institute of Planners* or THE AMERICAN CITY a country-wide analysis similar to the one you have made in New York.

ROLAND B. GREELEY
Managing Editor, A. I. P. Journal
Cambridge, Mass.

A County Highway Department Gets Two-Way Radio

By WALTER O. DOW
Emmet County Engineer
Petoskey, Mich.

ABOUT a year and a half ago our road commission wanted two-way radio for Emmet County, Mich. Motorola engineers conducted a survey to determine the location, type, and size of equipment needed. Our commission then studied feasibility from an economic point of view. We had to decide (1) whether it would increase our efficiency enough to pay for itself, and (2) whether the public would accept it without too much criticism, since all highway funds are limited and we had to cut our over-all 1950 budget sharply.

We found from the experience of other highway organizations that a two-way radio installation would pay for itself from the savings made over a three-year period. In answer to our second question, we decided to withhold any publicity until actual installation was completed and the radios were in use.

Radio has increased our efficiency in ways we never dreamed of. In the first place, it has added the equivalent of two hours' time to my working day. It should pay for itself in a much shorter period than we anticipated.

For the many other counties wanting two-way radio: you cannot decide to install a radio system today and have it working tomorrow. We Americans, including myself, are prone to take a year to make up our own minds and then expect the other fellow to jump. You cannot do this with a two-way radio installation:

I. The equipment must be made to order; this may be a matter of months.

II. You must have federal permits, and that is another delay.

III. Since this equipment operates on a fixed frequency, the suppliers cannot start grinding crystals for your transmitters until you have been assigned a frequency by the Federal Communications Commission (FCC). We made our first step toward getting a license on August 22, 1949, and received our final operating permit, or station license, on February 27, 1950. We found the agencies courteous and fair, but there were no short cuts. One step must follow another in the proper sequence. I am not trying to scare you, but to urge you to start as early as possible to get your permits. These are the steps:

a. Recommendation of a frequency
b. Application for a construction permit: (1) one application for each central station; (2) application to erect a transmission tower
c. Application for rating of air-navigation facility and lawful authority to operate a "true light"
d. Notice of construction or alteration of structures
e. Telegram to FCC of 10-day test period
f. Application for station license
g. Application for operators' licenses

A letter of recommendation for a frequency assignment must accompany your application for a construction permit. The application for a construction permit is made on FCC Form 401-B. You will probably need some assistance from your supplier in filling out the technical details requested about your equipment.

If the transmission tower is located within 20 miles of a civil airway, and the elevation of the top of the antenna is 150 feet or more above the ground, or if the top is more than 5 feet above the ground for every 500-foot distance from the nearest edge of an airport or landing strip, or is within 3 miles of the nearest airport or landing strip, then FCC Form 401-A should accompany your construction Form 401-B. In that case, your application will be referred to the CAA. If you secure their approval, you must fill out their Form ACA 117 (Notice of Construction or Alteration of Structures). Also, you will be required to fill out their Form ACA 114 (Application for Rating, or Air Navigation Facility and Lawful Authority to operate a "True Light").

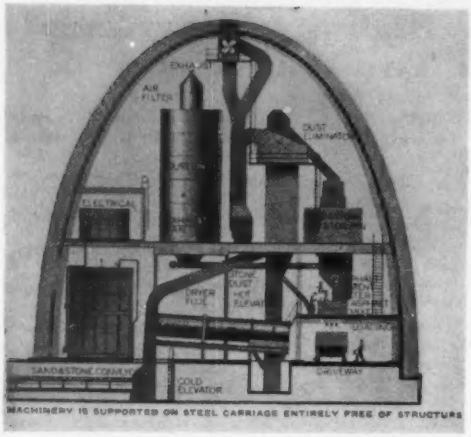
If you secure the approval on all of these applications, you will receive a construction permit from the CAA to construct your tower, and from the FCC to construct your radio equipment. You will also receive a specification from the CAA for marking and lighting your tower, and, also from the CAA, a license to operate your light.

As soon as your equipment is installed and your tower is erected, you must notify the CAA, by telegram, that the light is in operation; and notify the FCC that you are entering a 10-day test period.

Meanwhile, your application for a station license, FCC Form 403 (revised) must be filled out and sent in. You are allowed to operate as soon as the application has been filed. In due time, your station license will be received and you will have a full-fledged station.

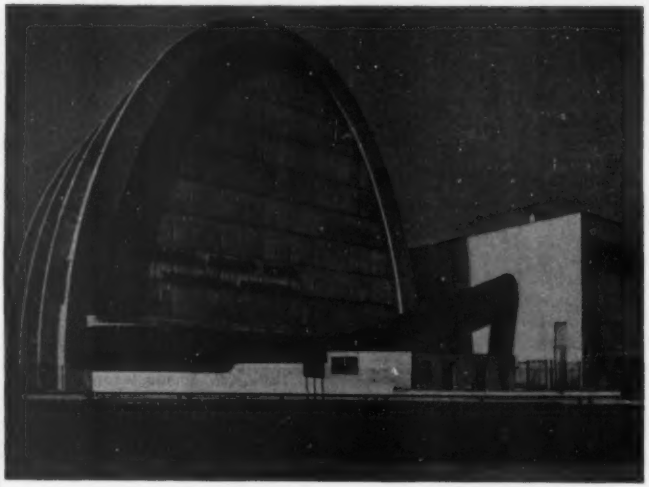
Asphalt Plants

Here is more evidence of the way that maintenance of asphalt streets is in the process of becoming mechanized in cities of all sizes across the nation



MACHINERY IS SUPPORTED ON STEEL CARRIAGE ENTIRELY FREE OF STRUCTURE

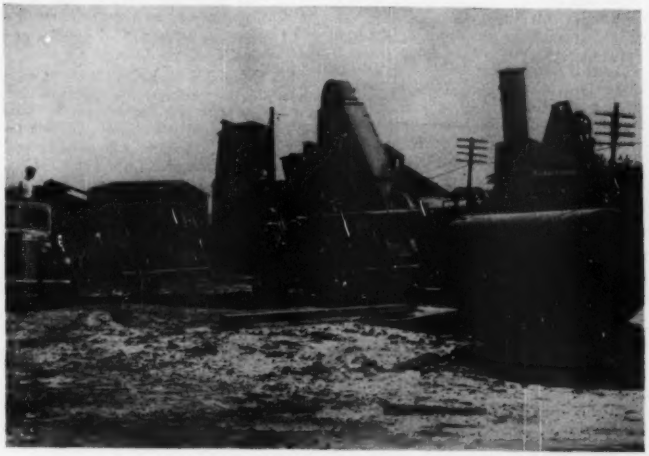
The nation's largest city, New York, undoubtedly has the most attractive asphalt plant. This one, built for the Borough of Manhattan, is located along the city's famous East River Drive. The diagram shows the arrangement of the equipment, which is totally enclosed by the graceful, arched structure. The plant is supported by steel framing and is independent of the building itself.



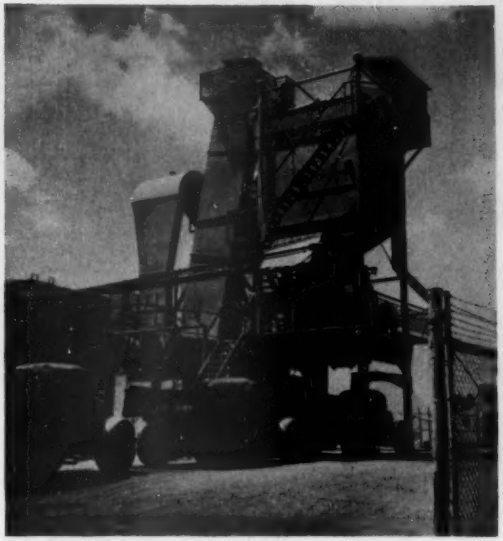
Among the smaller cities, we find Fergus Falls, Minn., operating its own central, hot-mix asphalt plant. City Engineer Egal Wefald has figures to show that by using the plant, his asphalt mix is costing the city about $4.60 per ton. This includes material, depreciation on equipment, haulers, labor, mixing, hauling, spreading, shaping, and compacting. Neighboring cities pay an average of $10.35, he reports. The plant was supplied by the Barber-Greene Co., Aurora, Ill.

IN GENERAL, asphalt resurfacing is a maintenance task. And because of the difficulty of preparing a contract for maintenance work to meet the varied and scattered street needs, cities generally like to do this work with their own forces. For many years, in large cities, this has required the use of city-owned asphalt plants. And in recent years, where a small city is far from a central, privately owned asphalt plant, the municipal asphalt plant appears to be gaining favor. The use of city-owned plants and pavers means more prompt attention to maintenance problems.

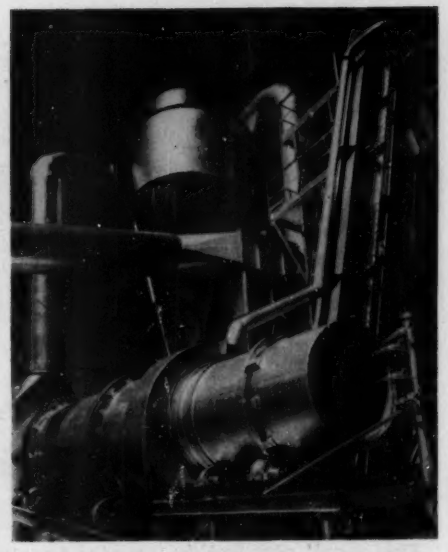
Illustrated on these two pages are plants that serve five cities. Page 157 carries the story of a sixth city, Lincoln, Nebr., one of the most recent to buy its own asphalt plant. This was supplied by the White Mfg. Co., Elkhart, Ind.



Serving Our Cities



St. Louis, for many years, has utilized this hot-mix asphalt plant, which is capable of turning out 1,000 tons of mix per day. The plant has a storage capacity of 5,000 tons of aggregate and 60,000 gallons of asphalt. Street Commissioner Henry Dawson is in charge of the work. The plant is a product of the Simplicity System Co., Chattanooga, Tenn.



In Los Angeles is found the country's first all-electric asphalt plant, built by the Standard Steel Corporation, Los Angeles. Its capacity is 4,000 pounds.

Long Beach, Calif., prefers using a traveling plant, which mixes-in-place asphalt and aggregate for low-cost residential-street surfacing. Director of Service James Kinkaid says that in 10 years the unit has helped rebuild some 350 miles of streets. The plant is made by the Wood Mfg. Co., No. Hollywood, Calif.

Right: The "lower pond" is one of the two that supply the city's water. Beautiful as it is, algae and sediment lowered the quality. *Below:* All that was required for plant structure — a filter bulding and clear-water reservoir.

Winooski's Automatic Filter

This small city builds a water-treatment plant using a self-washing rapid sand filter with no prior settling to purify a water supply of moderate turbidity

By JOSEPH F. LECLAIR
Superintendent of Water
Winooski, Vt.

ONE of the first reactions we had to our new water-filter plant sounded like a complaint. The cook in a local restaurant rushed to the proprietor, convinced that there was something radically wrong with the water.

"The ice cubes," she said. "They're all clear!"

And that was the way the water was, too. It was clear and sparkling, for the first time in many years.

We get our water from wells and surface ponds. At one time it was clear, and satisfactory for domestic use. After a period, however, the usual algae growths developed to color the water and give it a bad taste and odor. In addition, the water began to carry fine suspended solids resulting from the decomposition of the algae. All this pointed to the need for a new filter plant of some sort.

Population Served

Our department serves a population of approximately 8,000. The average water use is 50 gallons per person per day. In appraising our needs, Mayor Armand Rathe and the writer reviewed the various treatment processes that were applicable to our problems. We wanted something that gave good results, yet did not require a huge, capitalized investment or a big operating crew.

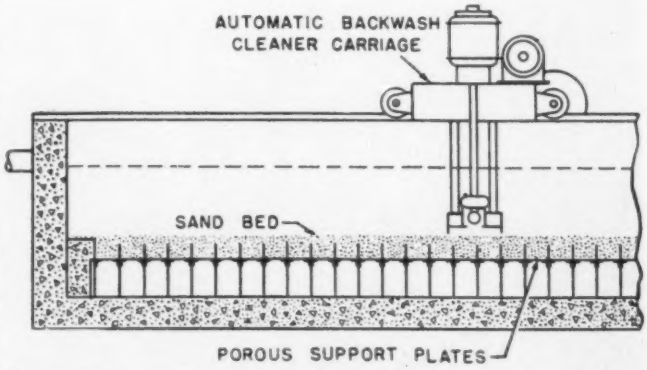
In the process of this study, our attention was drawn to the new Hardinge automatic-backwash, rapid sand filter, Since it was automatic, and could work well without the need of prior settling, it looked as though it would fit our requirements nicely. Consequently, we instructed our consulting engineers, Arthur Hoag and Associates, to design the improvement around the use of equipment of this type.

The filter plant they designed has a capacity of 1,500,000 gallons per day. This means that the normal demand can be met readily in an 8-hour day.

The raw water comes from an "upper pond" and flows to a "lower pond." At the head of this latter pond, we introduce chlorine through a Wallace and Tiernan feeder. The water then flows through the pond to the plant, where alum is added and the water is flash-mixed and passed through a flocculating channel. From here it goes direct to the filter without intermediate sedimentation.

No Wash Water Wasted

The filtered water passes to a clear well below the filter. Here three Fairbanks-Morse pumps, each rated at 930 gpm, transfer the water to a standpipe and to the distribution system. The



The automatic pump cariage moves across the filter bed to keep it clean.

solids which have collected on the sand bed of the filter are automatically removed, and the wash water returned to the head of the lower pond. Thus the actual waste of water is slight. A Continental gasoline engine serves as a standby for the electrically powered pumps.

Unusual Operation

The Hardinge automatic-backwash filter is somewhat unusual in its operation. It measures 12½ feet by 40 feet, giving an effective filter area of 500 square feet and a rated capacity of 1,500,000 mgd.

The filter-sand bed is divided on its length into 60 individual cells, each with 11 inches of filter sand, supported by porous plates and having water chambers below the plates connecting with an effluent channel outside the filter. This forms, in effect, 60 individual filters, each with 8.33 square feet of filter area.

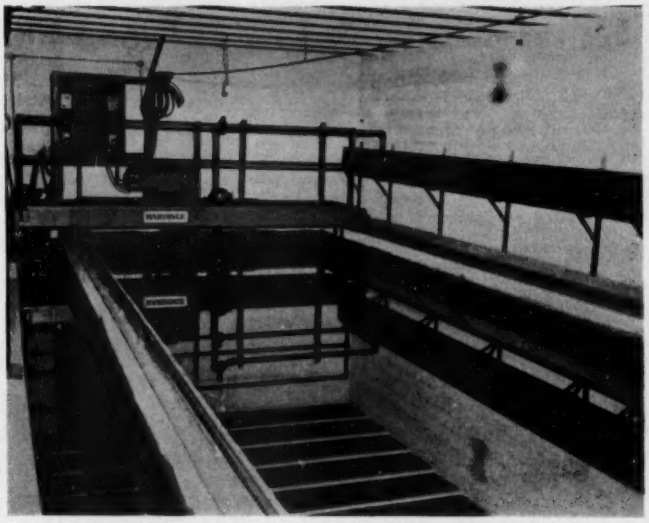
The cleaning mechanism comprises a motor-driven carriage movable along the length of the bed, with a wash-water collection box just above the sand, and a pump connected to the box to remove this wash water. A second pump in the effluent channel forces filtered water from the channel upward through the sand during the cleaning operation. The backwashing begins automatically when the accumulated solids cause the water level above the sand bed to rise to 6 inches above the level of the water in the effluent channel, and continues until this level has dropped to 4 inches, whereupon the cleaning operation ceases.

The carriage travels 42 inches per minute, during which time 100 gpm of filtered water are forced upward through the sand, amounting to 2.3 gallons per square foot of bed washed; and 120 gpm of water containing the solids washed from the sand are simultaneously removed from the system. In this case, where the suspended-solids' content of the influent is high, the backwashing cycle is approximately 28 minutes: 6 minutes on and 22 minutes off.

A Typical Day's Operation

A typical day's operation of the filter is as follows:

Time of operation..	8 hours
Flow to filter.....	455,800 gals., 950 gpm
Wash water returned to pond, 2.7%....	12,240 gals.
To standpipe.....	443,560 gals., 924 gpm
Power consumption for backwashing..	2.8 hph per 8 hours
Chlorine per day...	20 lbs.
Influent to filter....	.2 residual
Effluent from filter..	.1
Aluminum sulphate, 25.5 ppm	97 lbs. per 8-hour day
Flocculating time.	20 minutes



The left channel of the automatic backwash filter is the wash-water outlet.

Analytical results, by Vermont State Board of Health:

	Raw Water Influent	*Filtered Water*
Sediment	1	0
Turbidity	1	0
Color	35	0
Odor	1 MM	0
pH	7.8	7.0
Coliform bacteria	0	0

We have been operating for the past six months with no difficulty and virtually no added operating staff. The equipment performs reliably at surprisingly low operating expense. And it has been able to give Mayor Rathe and me the operating answer we were looking for—good performance at low operating and construction cost.

And as a final point, it is providing our householders and restaurateurs with a clear, sparkling glass of water and ice cubes that don't look dirty.

Houston to Double Water Plant Capacity

HOUSTON paved the way for another era of industrial expansion last August as its citizens voted four to one to spend $24,000,000 for an additional 150 mgd. The water will come from the San Jacinto River, and, added to the present capacity of city water wells, will give the city a water capacity of 280 mgd, according to F. N. Baldwin, Director of Utilities at Houston.

The water-bond issue was necessitated by Houston's expansion, especially during the past decade. The 1950 U. S. Census established Houston as the largest city in the South and 14th in the nation, with a population of 593,600—a 54% increase since 1940. Metropolitan Houston's population jumped to 801,169.

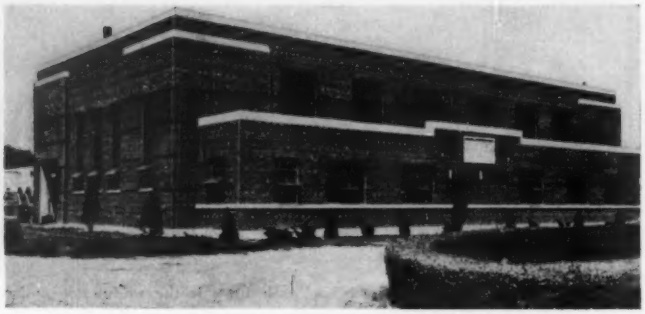
Specifically, the $24,000,000 in water bonds will provide for a $7,500,000 dam and $1,585,000 reservoir on the San Jacinto River in northeast Harris County; a $4,500,000 filter plant, with an average capacity of 50 mgd and a potential capacity to purify 80 mgd; a $375,000 pumping plant on San Jacinto River; and $2,000,000 for the purchase of independent water systems as a result of the annexation of territory formerly served by water districts and private companies.

Additional money will be expended for lining a canal to bring the water to industries; relocation of railroads; pipelines, etc., at the reservoir; construction of transmission lines from the filter plant to the city's distribution system; expansion of the distribution system; and administrative and engineering costs.

Houston officials expect the work to begin shortly.

Geneseo's New Diesel

More than 14 kw-hrs. per gallon of fuel is the record that the new diesel-powered generator is making for this Illinois city



The plant structure is built to trim, functional lines.

By M. L. BURGIN
Superintendent of Municipal Utilities Geneseo, Ill.

DYNAMITE isn't often used in a power plant if the plant is expected to keep on turning out kilowatts, but that is what happened in the Geneseo, Ill., municipal electric plant last year.

The occasion was the installation of a new eight-cylinder, four-cycle, supercharged Nordberg Duafuel diesel engine, required to meet the demand for electric power by the people and industries of Geneseo. To make room for the new engine, a four-cylinder, 280-hp unit was removed. The foundation required the dynamite work.

The foundation was a solid block of concrete measuring 8 by 8 by 24 feet. The dynamite consisted of 3-ounce charges detonated with electric fuses. Heavy tarpaulins were hung around the foundation, and the concrete base was covered with old mattresses. During the blasting operation, the plant continued in service and no damage was done to the building or equipment.

Ample Auxiliaries

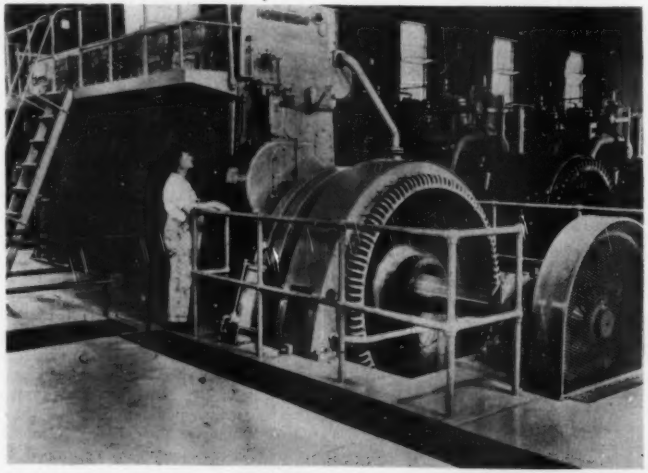
Only a minimum number of auxiliaries was required when the new Nordberg engine was installed. Fuel storage was ample, with five above-ground tanks supplying a total capacity of 80,000 gallons. The fuel flows by gravity to a fuel-transfer pump in the basement; through a Shutte-Koerting heat exchanger where the fuel is heated to 130°F.; then through a Sentinel felt-pack filter, and finally to the day tanks for the various units.

Neither was any additional cooling-water equipment required for the Nordberg engine. All units have closed cooling-water systems. The plant has two Diesel Service Company cooling towers. The larger, capable of handling 4,000 hp, has four fans. Two are thermostatically controlled and are started when the temperature rises above 140°F. The remaining two are manually controlled. This tower, now in use, has sufficient capacity for the plant's cooling-water requirements.

Reserve Tower

The smaller tower, with a 1,500-hp capacity, is held in reserve. There are five Fairbanks-Morse centrifugal cooling-water pumps, all of 5-inch size. Two are for jacket water, two are for raw water, and one is so connected that it can be used for either.

Lubrication oil is circulated by a Roper Pump with a capacity of 170 gpm at 50 psi. This pump takes its suction from the engine sump and discharges through a Ross heat exchanger, capable of cooling 175 gpm of oil from 160° to 138° by the use of 400 gpm of raw water at 95°. From the cooler, oil passes through duplex Nordberg strainers and then to the lube-oil header on the engine. A Honan-Crane purifier con-



It took 3-ounce charges of dynamite to blast a place for the big new diesel that has been recently added to the Geneseo power plant. The dynamite did not interfere with the operation of the other engine and did no damage.

tinually by-passes a portion of the lube oil, returning the cleaned oil to the system.

An interesting feature installed by the plant personnel is the duplicate lube-oil-circulating and fuel-oil-transfer pumps, so arranged with suitable controls that if the pump in service on either system fails, the duplicate unit automatically starts to function. Should a failure occur, warning lights appear and sirens sound at both the cubicle and the main switchboard, calling the operator's attention to this fact.

Intake air is silenced and cleaned by a silencer and air-intake cleaner with a weather hood. The exhaust also is silenced by Burgess-Manning silencers.

The installation of the Nordberg diesel has resulted in a material improvement in the kw-hr production per gallon of fuel oil. The total generation for the first seven months of this year was 4,837,200 kw-hrs on 382,480 gallons of fuel oil. Of this, the Nordberg unit developed 1,486,000 kw-hrs on 105,230 gallons. This gives the Nordberg unit a fuel consumption of 14.12 kw-hrs per gallon as compared with 12.63 for the plant during this period.

When natural gas is available to the plant, the operators expect to obtain an even higher rate of efficiency. The engine is of the Duafuel type and will burn either oil or gas on the full-diesel principle.

The installation of the last Nordberg, the placing of the auxiliaries, and the piping and wiring were done by the plant operating staff under the direction of the writer and Al Sieben, Chief Engineer.

The Use of School Buildings for Recreation

FACILITIES in school buildings are widely used for community recreation, and school and recreation authorities cooperate effectively in the conduct of school recreation centers, according to a report issued by the National Recreation Association. Entitled "The Use of School Buildings for Recreation," this report summarizes the findings of a study of school-recreation-center operation in 105 communities located in 32 states.*

The purpose of the study was to determine the nature and extent of the use of school buildings for community recreation; the limitations, if any, imposed by school authorities upon such use; the methods of financing, and the administrative arrangements for cooperation between school and recreation departments.

The inquiry was limited to communities in which (1) school recreation centers are administered by a separate recreation department or agency; (2) a community recreation program is conducted the year round under a recreation executive; and (3) better-than-average cooperation between school and recreation authorities was reported by field workers of the Association.

Summary of Findings

The situation revealed by the study as regards the use of school buildings by recreation departments is summarized as follows:

School authorities make available to the recreation department all types of indoor facilities suitable for use in the conduct of recreation programs. Gymnasiums, auditoriums, and attendant service rooms are used more frequently for recreation and in more cities than other school facilities.

Many types of school facilities now used in a few cities would be made available to more recreation departments if these departments had the personnel with which to conduct a program in them.

Weekday evenings and weekdays after school are the most popular times for recreation, with somewhat less use on school-vacation days and Saturday mornings, and little use during school hours.

Boards of education make their publicly owned facilities available for community use with as few limitations as possible. Few boards impose unreasonable restrictions which interfere with the effectiveness of the recreation program; the "no smoking" rule is the only restriction frequently reported.

More than one-half of the school authorities share in the cost of the recreation program; approximately one-fourth contribute funds to the recreation department, or carry a recreation item in their budget. One-fourth of the recreation departments are not required to make any payment for the use of school buildings; the others merely meet the cost of custodial service, pay a rental fee for the facilities used, or carry other use charges.

The recreational use of school buildings is sometimes reciprocated by school use of municipal recreation properties.

Board-of-education requirements as to numbers or kinds of personnel to be employed in schools used for recreation are few and reasonable; they usually call for less personnel than the recreation department would, in any case, require for its program.

Membership of a school-board member on the recreation board is the most common administrative device for facilitating cooperation between school and recreation authorities; nearly half of the cities report this procedure.

Periodic joint meetings of school and recreation boards or staff members, assignment of school personnel to the recreation staff, and joint employment of administrative personnel by school and recreation agencies are other effective cooperative arrangements.

In the opinion of recreation executives, a mutual desire to cooperate, an understanding of common objectives, and an effort to cultivate good personal relationships are the factors which contribute most to cooperation.

The necessity of using, for recreation, school buildings not designed for such use presents, by far, the most common obstacle to cooperation in the conduct of school recreation centers. Joint action in planning new schools for community use is considered an effective procedure for solving difficulties.

In Conclusion

The schoolhouse has become widely recognized in the U. S. as a building for both school and community use. Through mutual agreement by school and recreation authorities, responsibility for operating school buildings as community recreation centers is commonly assumed by the recreation agency in cities with a municipal recreation department. This arrangement facilitates maximum use of the school plant, and enables the recreation department to conduct a more diversified program than would otherwise be possible. Increasingly, recreation departments are given a share in the planning of school facilities designed for recreation use by both school and community groups.

*Available from: National Recreation Association, 315 Fourth Ave., New York 10, N. Y. Price 25 cents.

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Hospital Building Program Requires Local Action *Now*

By JAMES NEIL MORRIS*
Hospital Consultant

IN THE light of the existing national emergency, cities and towns throughout the country would do well to take immediate steps to survey their present hospital and medical-care facilities with great concern and thoughtful consideration. At no time in our entire history has it been so necessary that these facilities be operated and maintained at the highest possible degree of efficiency.

Many of our hospitals are out-moded; both the physical plants and the arrangement under which they operate leave much to be desired. The hospital of today is no longer an institution furnishing only bed and nursing care: it is a highly specialized facility providing all adjunct services to assist the medical profession in diagnosis and treatment, and in all types of emergency requirements.

A newspaper in Birmingham described the hospital as the "fort from which the battle against disease can be waged." Today we might well expand this definition to say that hospital facilities are tools in the hands of medical specialists and other trained personnel employed to prevent the loss of vital production man-hours.

In much the same manner that a mechanic would repair a sick lathe in a plant manufacturing essential defense materials, the hospital and its skilled personnel repair the sick worker and send him back to produce. Like the damaged lathe, a sick worker is not a producer. In cases of emergency, the role of the hospital and its specialized equipment is important beyond question.

Our Hospital Needs Are Great

In April 1949, the United States Public Health Service had received initial applications for grants-in-aid under the Hill-Burton Act (National Hospital Program) on some 800 new general hospitals. More than half of these were to be built in the South, and they included approximately 13,000 beds. But about 213,000 additional general hospital beds are urgently needed throughout this same section of the country. The need in other sections is equally urgent.

Hundreds of cities, towns, counties, and non-profit organizations have surveyed their needs and are now building hospitals under the Hill-Burton Act. They have recognized the responsibility they may be required to shoulder in furnishing adequate and proper hospital and medical care for civilians. They also want to insure healthy men and women for both the armed services and defense industries.

On the other hand, there are many other communities without adequate facilities and unable to build because of recent cut-backs in federal appropriations with which they could partly finance the work. In many cases, these communities had previously raised their share of the required funds through public subscription, or by a special hospital tax and sale of general-obligation bonds. State agencies throughout the country now have on hand approved applications for the new hospital projects that would justify an annual appropriation of at least $150,000,000 for the next five years, even if our present needs are to be met *only partially*.

Sufficient hospital and medical-care facilities are as important to our overall national-defense program as a gantry crane in a shipyard or a machine-gun turret on a B-36. The defense plant has not yet been planned that will operate without healthy and skilled workers. A review of production man-hours lost during World War II because of illness and accidents presents a staggering challenge to our hospitals today.

What would you do if 500 defense workers and civilians were injured tonight in your community? It is a serious and complex problem. It is not one to be overlooked in any community having a high concentration of defense production.

Every city and town throughout the country should now investigate the need for establishing auxiliary and emergency hospital facilities well beyond the limit of possible damage to its industrial area by reason of sabotage or other acts of violence. We have found by experience that hospitals are no longer immune to damage: they must be considered in exactly the same light as any other plant engaged in the vital defense effort. Precautionary and protective measures should be adopted in all cases without delay and, more than ever, all personnel should be constantly on the alert to detect and eliminate possible causes of fire or other damage to the physical plant and its equipment.

But to a great extent city officials' hands are tied. The existing Hill-Burton Act, therefore, should be revised to permit cities and towns with a heavy concentration of defense production to survey their needs, and to build emergency facilities in cases where all their hospital beds and services are concentrated in one or more closely related structures. In addition, the adjacent rural areas now without adequate hospitals should be encouraged in every possible manner to provide the required facilities as an adjunct aid to the larger areas of population.

The Hill-Burton Act also should be further amended to permit the Surgeon General of the United States Public Health Service to enter into cost-plus-a-fixed-fee types of contracts for the construction facilities in any area where investigation has shown critical need. This type of financing is justified because a similar procedure is being followed in providing for members of the armed services.

Hospital Equipment in Short Supply

It is my firm conviction that purchasing controls should be applied immediately to hospital equipment and supplies to insure delivery to critical areas. Hospital beds purchased today cannot be delivered for about six months and it is impossible to obtain delivery on sterilizing equipment in less than six to nine months. Priority should be based on a "certificate of necessity" approved by the local State Health Department and/or the regional office of the United States Public Health Service.

Our experience in World War II brought us face to face with shortages in the number of physicians, nurses, and other technical personnel required to furnish hospital and medical care for our production and civilian personnel. The present need is far more acute and apparent because of the heavy demands of the armed services and the resultant strain put upon local physicians. We can do no less than to provide these men and women with adequate equipment with which to do their jobs.

* Mr. Morris, whose offices are at Houston, Texas, was formerly a staff member of the United States Public Health Service district office in New Orleans. More recently affiliated with the Alabama State Department of Health, he is now retained as consultant in connection with hospital construction and maintenance problems in various parts of the country.

Denver's Moffat Diversion Project

The 48-inch prestressed conduit for Denver goes into place. The pipe is drawn up and partially backfilled.

By D. D. GROSS
Chief Engineer
Board of Water Commissioners
Denver, Colo.

FOR years Denver received all of its water supply from the South Platte River and its tributaries. In 1936, the first water from across the Continental Divide to serve Denver was brought through the Moffat Water Tunnel. This project, including collection conduits, tunnel work, a diversion conduit on the eastern slope, and a filter plant, supplying conduits from the filter plant to the city, cost $11,000,000. It was thought that with this addition to Denver's water supply the city would have a reserve for future growth for many years to come, but unusual activities and construction in Denver during and since World War II have made it necessary to make substantial improvements to the plant.

More Water to Arrive from the Western Slope

One of these larger improvements is now under way to provide for the use of more water from the Western Slope. The work immediately in hand involves the construction of additional settling-basin capacity at the Moffat Filter Plant, costing around $300,000. The contract for the construction has been awarded to the R. T. Bickhard Construction Company of Denver.

With the additional sedimentation in use it is expected that the capacity of the filter plant can be increased from a rated capacity of 56 mgd, which has been somewhat exceeded in actual practice, to 80 mgd. However, it will be necessary, in connection with the increased use of water at the Moffat Filter Plant, to construct new conduits, both for bringing water to the Moffat Plant and taking it away. In planning these conduit lines, sufficient capacity is provided not only to meet the present requirements, but also to provide a surplus for future growth. The pipe has been purchased for the construction of 8½ miles of 54-inch pipe from the Ralston Reservoir to the Moffat Filter Plant. This line will have a capacity of 134 mgd, which will be more water than can be used through the Moffat Filter Plant until planned future enlargements are made. High-water elevation in Ralston Reservoir is 420 feet higher than the water in the settling basin, which would make possible the draft of considerably more than 134 mgd through this pipeline when the reservoir is full.

Since past experience has shown that the reservoir will be at or near the high-water elevation during the period of time when the demand for water from the Moffat Filter Plant is at a maximum, the conduit line has been designed to withstand the pressure due to hydraulic heads when the reservoir is full. In order to keep the pipeline from excessive static heads under these conditions, pressure-reducing valves have been installed in the conduit lines.

The total estimated cost is $1,760,000. The pressure pipe has been purchased from the Lock Joint Pipe Company, of East Orange, N. J., for $1,196,000.

The installation contract has been awarded to Parrish-Linneman Construction Company, of Lakewood, Colo., on their low bid on unit prices estimated to make the installation cost $332,515. Regulating valves have been purchased from the Ball Valve Company of Beverly Hills, Calif.

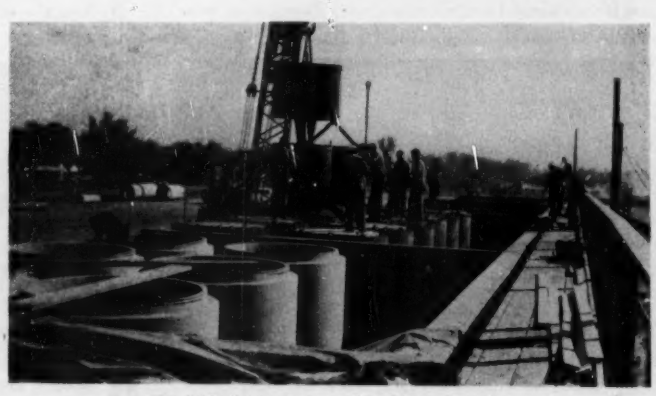
An Added Conduit to Provide Additional Capacity

To provide additional clear-water-conduit capacity from the Moffat Filter Plant to Denver, Conduit No. 21 is now under construction. This is a 66- to 60-inch pipeline, 19,126 feet in length. The low bidder on pipe was the Lock Joint Pipe Company. The pressure-pipe sizes and types involved are as follows:

66-inch concrete bar type
66-inch concrete cylinder type
60-inch concrete cylinder type

All sold for a total of $556,746 without installation. The pipe is being installed by the Hutchinson Construction Co., Denver, at an estimated cost of $194,113.

This conduit line was designed to deliver 100 mgd into Denver. By installing 66-inch pipe in the upper section, an additional 34 mgd can be delivered to suburban areas outside Denver. It is hoped that part of the construction will be completed in time for use in 1951, and all of it completed for use early in 1952.

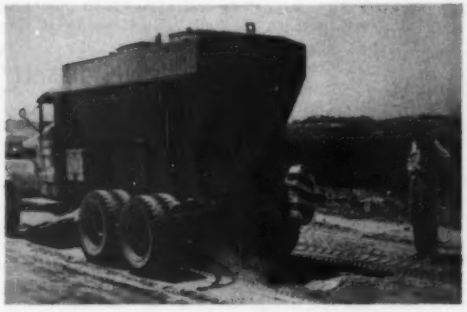


The 66-inch pipe is poured in 16-foot lengths.

One Soil-Cement Job Leads to Another

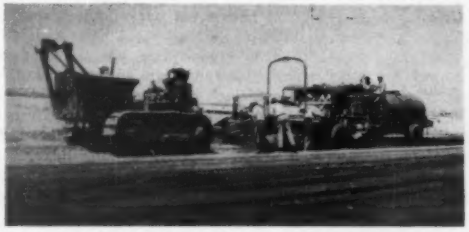
By RUSSELL A. HALL
Assistant City Engineer
City of San Diego, Calif.

San Diego receives bids for alternate types of paving, finds soil-cement proposals the most favorable



1 A hopper cement truck with a screw-conveyor distributes portland cement for the soil-cement base.

2 A caterpillar motor grader windrows the sub-base material over the cement preparatory to mixing.



3 The Wood mixer then takes over to blend the soil and the cement, and to produce a homogenous mix.

4 This shows a rear view of the mixing operation. Note the compacted soil-cement base on the left.

5 The motor grader next shapes the mixed soil-cement base material to proper crown and grade.

6 Next, a pneumatic-tired roller compacts the base and produces a layer approximately 6 inches thick.

THE City of San Diego constructed its first soil-cement street in June 1949, and since that time has completed four other soil-cement projects, with a fifth under contract. This will give a total of 2.11 miles of 66-foot roadway completed and 3.27 miles of four-lane divided, limited-access freeway under construction.

The first use of soil-cement was on Ventura Boulevard from Midway Drive to Mission Boulevard, over land being reclaimed by dredging the tidal flats in the Mission Bay Project. This new street connects metropolitan San Diego with the beach areas of the city north of Mission Bay, and replaces the old route along Mission Boulevard. This old route is being cut off by construction of three jetties into the Pacific Ocean to provide entrances to Mission Bay and the San Diego River flood channel.

Alternate Bids Received

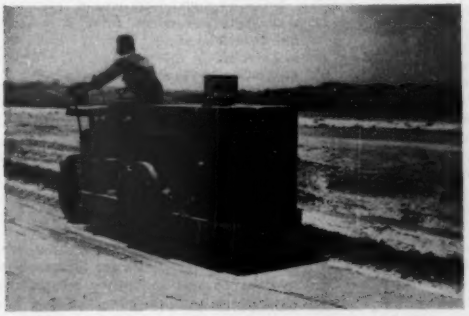
The work on Ventura Boulevard consisted of grading, paving, and installing storm-drain structures upon 0.9 miles of four-lane highway under a unit-price contract. Specifications called for a 3-inch asphaltic-concrete pavement to be placed upon a 6-inch treated base. Alternate bids were received for treatment of the native base material with emulsified asphalt or with portland cement. There were four bidders, and the low bids were $134,245 and $128,000 respectively, with the Griffith Company, of San Diego, receiving the contract on its low bid, which included the 6-inch soil-cement base.

Testing procedure and construction practice have been essentially the same for all projects so far completed. Soil samples of the base material were analyzed by the San Diego Testing Laboratory to determine the required cement content, optimum moisture, and maximum density. The laboratory also maintained field equipment on all jobs and kept accurate control of these factors throughout the work. The soils treated were native roadbed materials, except for one job where it was economical to import a higher quality of material in order to reduce the cement content. The cement content was varied from 7% to 10% by weight.

Six-Inch Base

After the grading was completed, the roadbed materials were scarified, pulverized, and carefully balanced to give a 6-inch depth of compacted soil-cement. The bulk portland cement was then evenly spread along the center of the strip to be mixed by a variable-speed, screw-conveyor feeder attached to the rear of a hopper cement truck, and the material in the strip was windrowed over the cement by two passes of a motor grader. This was followed by a traveling mixing machine which mixed the soil and cement with the required amount of water. A motor grader then shaped the section to crown and grade, and was followed by rollers that compacted the mix to maximum density. After a final pass by the motor grader to remove all surface irregularities, a bituminous curing seal was immediately applied. After a seven-day curing period, the soil-cement bases were surfaced with the specified plant-mixed, asphaltic-concrete wearing surfaces. Although all of the soil-cement construction so far completed has been mixed in place, the specifications permit the base material to be batched and mixed at a central plant and spread on the subgrade to the required depth by means of a suitable mechanical spreader.

All of the work was designed and constructed under the direction of A. K. Fogg, City Engineer. Plans and specifications were prepared in the City Engineer's office under Albert R. McKee, Engineer II, and the construction was supervised under the direction of Edward Gabrielson, Engineer IV.



7 A Galion steel-tired roller follows to produce the final compaction to the surface of the base.

8 A bituminous seal is applied to cure the mix, and then the mix is allowed to cure for seven days.

9 A Barber-Greene paver places a 3-inch asphaltic concrete wearing surface to complete the project.

10 Here is a view of the finished boulevard; smooth, and with ample capacity, and built at low cost.

Differential Taxation *Of Land and Buildings*

Experience of four municipalities of Western Canada with partial exemption of improvements from real-estate taxation

FOR authoritative current data to answer inquiries as to the results of the differential taxation of land and buildings in municipalities of Alberta and Saskatchewan, THE AMERICAN CITY has secured from four of these cities the statements which follow:

LETHBRIDGE, ALBERTA

Mayor L. Sherman Turcotte writes:

You are correctly informed concerning a differential in taxation in this city between improvements and land values. The tax rate is the same, but improvements are assessed for taxation purposes at 66 2/3% of their value, whereas land is assessed at 100% of its value.

Our land assessment starts at $400 per front foot on what is considered the main street and decreases progressively towards the outer edges of the city. Residential property 14 blocks distant from the main street is assessed at $10 per front foot. Under our zoning by-law, all of the new residential sections have a minimum 50-foot frontage for residential sites, and most sites have a depth of 125 feet.

Of course the assessment of improvements is not based on present values. On a home costing $12,000 today, the 66 2/3% assessment is only $3,430, so that actually the mill rate is levied on about 30% of present-day values.

The comparative figures for 1941 and 1950 are as follows:

Assessments

	1941	1950
Land (100%)	$3,280,415	$ 5,418,520
Improvements (66 2/3%)	6,566,010	13,118,445
Personal	458,950	507,945
	$10,305,375	$19,044,910

Tax Levy

	1941	1950
City purposes	22 mills	22.7 mills
Public and separate schools	17.50 mills	27.3 mills
	39.50 mills	50 mills

Revenue

	1941	1950
Tax levy—city	$225,301	$447,318
Tax levy—public schools	160,824	441,012
Tax levy—separate schools	19,634	78,136
Rental tax 8% on rental value of business premises	46,170	68,000
Electric light and power profits	94,000	165,000
Water-works profit	25,000	13,100
Licenses, etc.	19,600	19,189
	$590,529	$1,231,756

This city owns its own electric-light and water-works systems. Both systems earn a substantial profit each year, even though very large sums are being spent for extensions due to the rapid growth of our city during the past five years. (It is estimated that our population has increased 40% since 1945, to about 23,000 today. There will be a new census in 1951.)

In addition to regular taxation, there is a tax for local improvements, e.g., sidewalks, curbs, gutters, boulevards, and in some instances, sewers. These improvements are paid for over a period of 20 years, with the city paying one-half and the benefited taxpayer paying one-half. This tax amounts to about 25 cents per front foot for capital cost and maintenance.

Hard-surfacing since 1937 has been paid for out of general taxation.

Our bus system is operated by the city and loses money—$27,000 in 1949.

In common with other Western Canadian cities, Lethbridge boomed from 1908 to 1912. The ensuing real-estate crash caused the city to acquire title to virtually all vacant lands through tax forfeiture. Growth from 1920 to 1942 was not very large. Since then there has been a rapid growth.

Lands have been sold by the city, but with a building commitment on each sale. The result is that we have been able to eliminate land speculation and have developed new residential areas, block by block, with no vacant properties intervening.

From these land sales and utility profits, we built up a substantial surplus. With this surplus we have constructed a new city hall, a new police station, a new civic sports center (with three gymnasiums and a swimming pool), a new civic ice center with a skating rink and 10-sheet curling rink, and an addition to our public library, at a total cost of about $1,000,000 (all paid for).

Uniform Cities Act

Up to the present time, each city in Alberta has had its own charter under a Special Act of the Alberta Legislature. The Provincial Government now wishes to pass a Uniform Cities Act which will govern all cities in the province. The first draft of the Act contained a provision requiring 100% assessment of improvements. However, owing to protests from all cities concerned, I believe that the new Act will contain a provision for 60% assessment of improvements.

Milk River, a town south of this city, has had no tax on improvements for many years, but recently it had to change to assessment of improvements in order to obtain the consent of the Utility Commission to borrow money for water works.

Another town, Coaldale, 10 miles east of here, has had no tax on improvements for the last five years, and as a result they have been successful in having vacant lands in the center of the town built upon.

EDMONTON, ALBERTA

Commissioner J. Hodgson writes:

I do not think it peculiar to Edmonton that improvements are taxed at a lower rate than land values; in fact, I think this is universal in this province. The figures for 1940 and 1950 are as follows:

Assessment and Tax Levy

	1940	1950
Land (100%)	$22,841,800	$39,051,220
Improvements	31,877,850	80,491,520
60% on commercial property 50% on residential		
Tax levy	51.50 mills	49.50 mills

You ask also if there are any other taxes or service charges levied for the supply of local government and public schools. We have one other, called the Business Tax, which is based on rental values of business property, the taxes varying according to the class of business. Manufacturing establishments pay 6%, stores 10%, professional men 12½%, and railroads and trust companies up to 20%.

In this city also we derive a large amount of revenue towards the reduction of taxes by reason of profits on our municipally owned utilities. For 1950 this figure amounts to approximately $1,500,000, derived from the profits of operation of the Power House, which produces our electricity from coal; from the Electric Light Distribution Department, which sells the energy, and from the Water Works Department, the Transit Department, and the City Telephone Department. Edmonton is one of the two cities in Canada that operates its own telephones.

I personally am in favor of all improvements being 100%, the same as land. I

tried to get this point over with our Provincial Government early this year when they called a conference of all municipalities to discuss a Uniform City Charter for this province, but I got no support.

SASKATOON, SASKATCHEWAN

Mayor J. S. Mills writes:

I shall try to give you as accurately and as briefly as I can some of the main features of taxation in this city. First of all, we have a double system. That is, we have a tax on land and also a tax on improvements. The tax on land is reckoned on 100% of its fair value and the tax on improvements is restricted by Provincial law to a maximum of 60% of their assessed value.

Assessed values in this city are not determined by the condition of the building, but are determined by the size of building and type of construction. That means that there may be two houses side by side on the same street of the same size which pay the same taxes although one has trim lawns and neat fences and is well painted, whereas the other night be in very poor physical condition. These houses, of course, as I have said, must have originally been of the same construction, that is, both of them might be frame houses or both brick construction.

Originally Saskatoon was a boom town and there were very few buildings here. Practically all we had was land for sale. The result was that land was assessed at its full value, which was revised yearly to make the speculator pay in taxes as much as possible. Buildings were assessed at 60% of their value. I imagine this rate was chosen because values in the real-estate market rose and fell and it gave the assessor less trouble to keep to the 60% rate because there would be fewer appeals against his assessment.

This 60% on buildings applies to all Saskatchewan cities both large and small. There was a time when we assessed buildings in this city at 25% of their value. In the year 1914 our assessment on land in this city was over $55,000,000, while our assessment on buildings was a little less than $4,000,000. When the boom broke, much land returned to the city because of non-payment of taxes, and the result was that the rate on buildings was increased gradually to 60%, which is the maximum assessment rate that is allowed by law.

To summarize, real estate in Saskatoon is not considered a unit but is made up of two items—the land and the buildings—taxed on 100% of assessed value in the case of land and 60% in the case of buildings.

During the last 15 years, our land assessments and our building assessments have been about equal. Recently, however, owing to the large amount of building going on in this city, the assessed value of buildings is now over $27,000,000, whereas the value of land is only $23,000,000.

All our taxing bodies in this city, like the school boards, send in a requisition to our city council and the mill rate is struck on the amount of such estimates. In other words, we have in Saskatoon only one tax-collecting body and the taxes so collected are distributed according to the needs of our different boards.

In addition to taxes on land and on buildings, we have a business tax. At one time we had an income tax, which has been abolished. We have had no experience with personal-property taxes.

REGINA, SASKATCHEWAN

R. B. Wells, City Assessor and Tax Collector, writes:

In Regina (population, just over 70,000), land is assessed at 100% fair value while buildings are assessed at 30%. The City Act, which is provincial legislation governing all cities in the province, states "Buildings and improvements upon land shall be assessed at not more than 60% of their fair value." An agitation was started in Council to raise our building-assessment percentage to the 60% which is used throughout the rest of the province.

I prepared all the necessary information showing how the over-all assessment would go up and how the mill rate would come down. I worked out the effect on numerous well-known business blocks and also on certain residential sites. When it was obvious that a part of the tax assessment would be removed from vacant land and from valuable land containing cheap buildings and that many home-owners would have an increase in taxes, the idea was turned down by Council.

A commission appointed by the Government to look into provincial-municipal relations in all its aspects has recently submitted its report; I notice they recommend the assessing of land and buildings as a unit and bringing building assessments to 100%. I am definitely opposed to this idea and I am sure a good percentage of all the other assessors in the province are also. Land values are arrived at in an altogether different way to building values and it is a step backwards to try and assess them as one.

I am all for our present 30% assessment on buildings. It is a compromise between the "single taxers" and the Americans who assess everything a fellow owns at 100%.

It may interest you to know that our rural areas are assessed for land only, that buildings are entirely exempt, and, of course, we have no personal-property tax.

As requested, I give below the following information:

1950 Assessment

	Gross	*Exemptions*	*Net*
Land (100%)	$32,179,320	$11,865,135	$20,314,185
Buildings (30%)	25,826,290	6,998,260	18,828,030
Business	6,601,315	.....	6,601,315
Total	$64,606,925	$18,863,395	$45,743,530

The 1950 tax rate, including general municipal, collegiate, public-school, public-library, and provincial-government tax, is 60 mills.

The corresponding rate in 1940 was 50 mills levied on net assessments of $19,469,810 on land, $15,675,485 on buildings, $5,504,450 on business, with $40,649,745 total.

The business tax in Saskatchewan is derived by assessing all business at a certain rate per square foot, varying according to the type of business. This assessment is subject to the current mill rate.

On August 1, 1949, a committee of the City Council, appointed to consider a proposal to increase the 30% assessment on improvements, reported the conclusion that "an increase in the percentage rate of assessment will react to a greater degree against the small home-owner and will tend to discourage building in Regina. In the opinion of the Committee, no change should be made in the percentage rate of assessment and we so recommend." The Council concurred in this report.

Maine Development Credit Corporation Increases Business

MAINE'S Development Credit Corporation is paying off with increased business for the state, the American Society of Planning Officials reports.

As a direct result of its efforts, the Corporation has obtained eight new industries for the state, according to a recently released progress review. In addition, it has loaned out $136,500, with another $142,000 in credit approved for three more companies. To date, the program has produced jobs for more than 1,300 workers.

The Corporation, created by an act of the 1949 legislature, was aimed at bringing new payrolls to the state by providing a source of venture capital for establishing or expanding small business enterprises. It was formed mainly through the efforts of the Maine Bankers Association, who believed that $1,500,000 in the hands of the Credit Corporation would give a bigger boost to business than the same amount in the hands of a bank. It can step in where local banks are unable to furnish capital loans for providing the final margin of credit—over and above regularly available bank loans—to enable a new business to get started.

Working funds of $1,500,000 for the Corporation came partly from the sale of $50,000 capital stock to local industries, the remainder being supplied by Maine commercial and savings banks, building and loan associations, and insurance companies.

The usual rate of interest is charged for loans, and all losses are absorbed by members in the same proportion as their contributions to the capitalization, with the advice of a local board of business men and bankers. The board also assesses the proposed new business or business expansion in relation to the economy of the community, and makes sure that no local bank is able to handle the loan directly.

Sanitary Fill Standards

A yardstick, adopted by the Illinois Department of Public Health, to measure this type of refuse disposal

By C. W. KLASSEN
Chief Sanitary Engineer
Illinois Department of Public Health

Design Basis

Allow 0.75 to 1.5 acres of ground per year for each 10,000 inhabitants, with compacted garbage depth of 6 feet.

Allow 1 cubic yard of compacted garbage and refuse per person per year. Anticipate a compaction of 20 to 35% original volume.

Make actual garbage and refuse measurements with compaction tests to determine design factor. Such tests must be made on an adequate quantity of representative garbage and refuse.

Expect 2 to 3 pounds of garbage and refuse per capita per day, 0.3 to 0.7 pounds of garbage per capita per day for cities; 0.6 to 0.9 pounds of garbage per capita per day for institutions.

Plan for 1 ton of garbage and refuse to occupy about 1 to 2 cubic yards when compacted.

●

Access Roads

Consider length of haul. Long hauls may be costly because of time lost and vehicle operation. These costs should be computed before selecting the site.

Build roads capable of withstanding wet-weather operation and weight of garbage trucks.

●

Underground Pollution

Do not build on exposed rock strata. In Illinois, limestone strata are likely to have solution channels or crevices to convey pollution. Keep a minimum of 30 feet clayey-till overburden between strata and refuse unless studies indicate that a lesser depth is satisfactory.

Locate fill at least 500 feet from drift wells unless studies indicate that subsurface seepage is not imminent.

Do not place garbage and refuse in mines or other areas where resulting seepage or leachate may carry waste to water-bearing strata or wells. Remember that chemical pollution may emanate from a fill and probably will travel for long distances as compared to organic and bacterial pollution travel.

Do not locate sanitary fills on or near springs.

Consult the State Water Survey, State Geological Survey, and the Illinois Department of Public Health regarding any problems of possible underground pollution.

Provide a sand-filled trench at the toe of sanitary fills to collect seepage where soils are not adequately porous to absorb it.

Keep mineral and bacterial studies on wells near sanitary landfill active before, during, and after sanitary landfill operation. This will indicate freedom of pollution but probably will not be of much help in preventing further pollution, should pollution start. Seepage from sanitary landfills has shown a strength of 170 to 5,900 ppm BOD; coliform organisms 9,500 per cc; total bacterial counts 33,000 NH_3-N-62 ppm, and iron 52 ppm.

Do not build sewers through fill material or structures on fills unless precautions are taken to prevent gas seepage to points where it may be hazardous. Flammable gas will emanate until bacterial decomposition is complete.

●

Surface Pollution and Drainage

Prevent concentrations of run-off water that may cause erosion or washing of fill material.

Prevent ponding.

Prevent undue seepage into fill.

Provide drainage facilities around sanitary-fill site where necessary.

Do not locate sanitary fill in a site subject to flooding unless adequate precautions are taken to prevent erosion of fill and washing of garbage and refuse.

Do not place sanitary fill where leachate cannot be controlled before it causes stream pollution.

Provide for drainage during filling.

Provide for additional cover, regrading, seeding, grass waterways, etc., to assure permanent stability to fill site after completion and during settling.

Leave slopes on fill surface of 1% as a minimum. Use recognized slope factors depending on final ground use.

Allow for settlements; fills have been known to settle 20% to 25% over a two-year period. Over half occurred in the first six months. Regrade if needed, and fill cracks.

●

Operation

Select this type of equipment:

- Track-type tractor with front-end loader or Bull Clam
- Bulldozer-dragline combination
- Carry-all scrapers and bulldozer
- Bulldozer and trucks to haul dirt in
- Other combinations, depending upon local conditions

Keep roads weatherproof. Facilities

Rockford is one of the cities in Illinois using the sanitary-landfill method of refuse disposal. A Link-Belt spreader excavates the next day's trench while an Allis-Chalmers tractor-bulldozer handles the incoming load of refuse.

such as planks or airplane landing-strip mats help.

Provide bumper logs for side dumping into trench.

Stock-pile suitable road material. This material must not have putrescible matter in it.

Compact in layers not over 12 inches deep.

Compacted depth in single lift not to exceed 8 feet.

Provide snow fence or chicken-wire fence to catch blowing papers.

Do not allow scavenging unless adequate control can be maintained to prevent rat harborage and fire hazards.

Possible types of operation:

1. Trench—dump from side.
2. Trench—dump from end.
3. Trench—dump at end and transport material to final resting place with front-end loader, bulldozer, or other device.
4. Area method in quarries, gravel pits and marshy places. Daily cover hauled in.
5. Area method in gullies. Dump from side. Transport daily cover material. Divert water.
6. Area method on rather level ground. Dump material on area convenient for compaction by tractor and such that compacted depth is 6 feet by time to close sanitary fill for the day.

Close sanitary fill at end of day. Provide large container in which individuals could deposit material after hours, if such service is desirable. This could be transported to sanitary fill first thing next day.

Personnel:

1. Operate equipment.
2. Keep records.
3. Clean up site.

Maintain a portable house for personnel, tools, and maintenance equipment.

See that fire-fighting facilities are available.

If one fills in water sites, provide a raft and fences below and above water or other suitable devices to stop floatage and blowing papers.

Make periodic inspection to see that site is operated according to plans, without nuisances, flies, mosquitoes, or rats.

Provide temporary fly, mosquito, and rat control with insecticides and rodenticides, if needed.

Winter operation:

1. Stockpile cover.
2. Cover area to be excavated with leaves or other similar material.
3. Erect snow fences to protect access roads.
4. Provide for prolonged wet-weather operation.

Ultimate Land Use

Recreation areas
Parking areas
Farmland reclamation—contact local soil-conservation service for erosion-control standards
Airfields
Golf courses

The Next Step for City Management

A proposal for formalizing a city's general staff in an "office of the city manager"

By HARRY L. MORRISON, JR.
Executive Secretary
Citizens' Advisory Committee
City of Alameda, Calif.

THE confidence of our citizens in the council-manager system, together with a greater understanding by both the council and the city manager of their relative positions, has resulted lately in a widespread movement to reorganize many cities to give the manager greater control, financially and otherwise, and also to give him assistance in his office to care for many of his more routine and detailed tasks.

Unified Department of Finance

For example, Berkeley, Calif., has created in the last year a unified department of finance which includes the functions of budgeting, accounting, treasury and collections, purchasing and stores, assessing, and administration of taxes and licenses. Such a unified department is not in itself remarkably unique, but the innovation completed in Berkeley is that the Assistant City Manager is *ex officio* Director of Finance and Budget Officer. The Long Beach (Calif.) Council has received a recommendation from Louis J. Kroeger and Associates for the organization of a department of administrative management. This department, which would be directed by the Assistant City Manager, would combine the functions of administrative planning, budgeting, central services (such as buildings and grounds, office services, etc.), purchasing, and personnel.

Both of these proposals are headed in the direction of building an integrated "general staff" that will free the city manager for his more important duties of general supervision, and yet give him great management control.

At the national level of government, the establishment of the "Office of the President" has given the President more control over his administration by making certain of the federal governmental-staff functions subject to his immediate and direct authority. It has been realized in federal administration that the President simply cannot delegate certain of his vital staff functions to department heads and keep the necessary managerial control.

The management principles that apply to the President of the United States apply in like measure to the chief executives of our cities, particularly our large cities. As has been illustrated, certain trends are taking place in unifying the staff functions in some of our cities. The next step would seem to be the institution of an "office of the city manager," wherein there would be assistants or aides to help the manager measure up to high standards of duty, competency, and responsibility, and allow him to perform the tasks of leadership in a manner not apparent in most cities today.

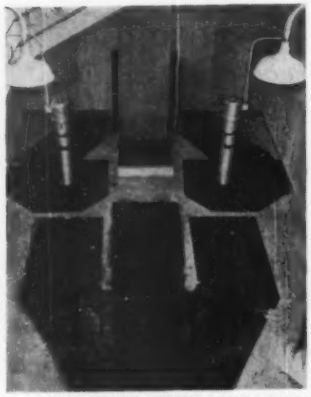
For instance, within the city manager's office would be such bureaus as the budget, administrative planning and research, central services (the housekeeping functions), personnel, and public relations. The bureau chiefs would be assistants to the city manager and would work as a "team" with the city manager in formulating the city's administrative policy. The assistant city manager could act as a chief-of-staff and carry on much of the detailed administrative work for the city manager. In addition, the various assistants to the city manager who were bureau chiefs would speak with the authority of the city manager and represent him in many situations in which he was unable to participate directly.

Freedom from Detail

The concept of the "office of the city manager" would do much to free the city manager from the detail of administration, while allowing him intimate control of his management "tools" and giving him an opportunity to coordinate his line departments more thoroughly.

A City-College Sewage Plant

Ames, Iowa, and Iowa State College built collectively a sewage-treatment plant adequate for both, and useful to the latter in its sanitary-engineering instruction and research. Cost-sharing formula is developed by the city and college



PHOTOGRAPHS COURTESY OF VALO PHOTOS

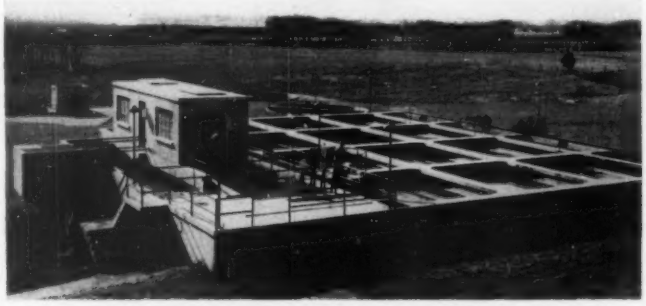
Comminutors provide the first step in sewage treatment. Note the bar screen in the center for emergency service.

THE City of Ames has recently placed in operation a new sewage-treatment plant which is being jointly financed by the city and Iowa State College. This new plant will permit the abandonment of the overloaded and rather obsolete treatment plants previously operated by the city and college. The present total resident and student population served is approximately 23,000.

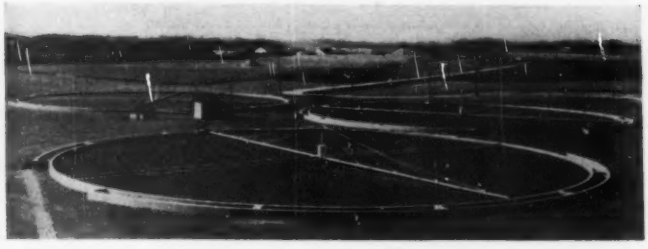
In the past, the city has been served by an Imhoff trickling-filter type of plant, adequate for a population of about 8,000, and the college has used an Imhoff plant with sandbed filters designed to serve a much smaller student body than at present. Both plants emptied their treated wastes into a small watercourse which extends through the city and during the summer months frequently has no flow. With the growth of the city and college, and the greater attention that the people of Iowa have given to stream sanitation, everyone agreed that this arrangement should no longer be tolerated.

The city and college entered into an agreement whereby the initial cost of the treatment plant and outfall sewer, as well as future operating costs, was to be borne by the respective parties on the basis of the amount of sewage contributed by each. Preliminary studies indicate that the division of costs will be approximately 70% city and 30% college. The outfall sewer, with a designed capacity of 11 mgd, was completed in 1947 at a cost of $160,000, and the treatment plant when finally completed will cost approximately $1,000,000. The city's portion of this cost will be financed by the issuance of $500,000 of general-obligation bonds, the principal and interest of which will be paid by a millage tax on all privately owned property in the city, and $365,000 of sewer-service bonds, the principal and interest on which will be paid from a monthly sewer-service charge based on metered water use to all privately owned property connected to the sanitary sewers of the city.

In the design of the plant, consideration had to be given to producing a very stable effluent, as the discharge from the plant empties into a small stream which at times contains little or no flow. At other times, the flow in the stream is sufficient to permit some modification of the treatment in the plant. Through a cooperative agreement between the city and the United States Geological Survey, a stream-gauging station will be maintained with a continuous recorder in the control room at the plant. This will permit regulating the degree of treatment at the plant in accordance with stream conditions.



Aeration and primary clarification are provided here.



Trickling filters give the final treatment.

Treatment Details

The present design and construction anticipates a future population of 30,000 and is so arranged as to permit the maximum of flexibility in methods of treatment and for by-passing, if necessary, for proper maintenance. The sewage enters the plant through two 25-inch Chicago Pump Company comminutors, with a by-pass channel equipped with a manually raked bar screen with 1½-inch clear opening. A Parshall flume 9 feet by 11 inches in length and 2 feet in width, with a recording Builders Providence "cronoflow," is provided for measuring the volume of sewage entering the plant.

The sewage is pumped from a wet well to the aeration tanks by four Fairbanks-Morse lift pumps with capacities

By JOHN H. AMES
City Manager
Ames, Iowa

of 1,650, 2,200, 2,750, and 3,850 gpm. These pumps are equipped with a float-operated program-switch to accommodate sewage-flow rates within a range of 2.38 to 11 mgd. Local flood conditions require pumping the full capacity of the outfall sewer to the lift station with provisions to treat 5.5 mgd through the plant and by-pass the remaining 5.5 mgd.

Aeration Provided

There are two parallel aeration tanks 22 feet long and 6 inches square with 1:1.4 minimum sloped hopper bottoms which provide 40 minutes' detention at 2.38 mgd. Each unit is equipped with a mechanical aerator unit (Proquip) and a grit elevator (Proquip). The hopper bottoms are sloped to a point at the center of each unit to accommodate the installation of the grit elevator immediately adjacent to the mechanical aerator unit.

From the aerators the sewage passes to four primary clarifier units each 20 feet wide and 50 feet in length, with an average water depth of 6.5 feet. The clarifiers are each equipped with Walker Process sludge-collectors, designed at an overflow rate of 600 gallons per square foot per 24 hours at 2.38 mgd average flow. The overflow weirs are based on 5,100 gallons per foot of weir length per 24 hours.

From the clarifiers the sewage goes to three trickling filters equipped with Dorr rotary distributors. These are each 135 feet in diameter with an average rock depth of 8 feet.

There are three final clarifiers, each 41 feet in diameter with an average water depth of 8 feet, designed on the basis of 600 gallons per square foot per 24 hours, at 2.38 mgd average flow. Each unit is equipped with Chain Belt "Tow-Bro" sludge-collection equipment.

When stream conditions require, the effluent will pass from the final clarifiers to a chlorine contact tank 55 feet by 21 feet, with an average depth of 5 feet 10 inches. This contact tank is equipped to provide 30 minutes' detention at 2.38 mgd.

There are two digesters, each 50 feet in diameter, with a total capacity of 90,000 cubic feet, or 3 cubic feet per capita equivalent. Digester No. 1 is equipped with a Pacific Flush Tank floating cover, and Digester No. 2 is equipped with a Pacific Flush Tank gas holder providing 17,000 cubic feet of sewage-gas storage. The gas from this holder will be used in a Climax generator, driven by a sewage-gas engine, which provides partial electrical energy for the plant and for heat. A 72-inch concrete-pipe tunnel connects the control house with the digester control room.

One digestion tank has a floating cover. The other is a fixed gas holder.

The lower floors of the control building (86 feet by 37 feet) contain the wet well, lift-pump room, plant-heating equipment, gas engine, tools and equipment, transformer rooms, and garage. The upper story contains an office room, electrical-control room, lavatories, and a plant control room.

Since Iowa State College is contributing a substantial part of the plant construction and operating costs, ample provision has been made in the 17-by-35-foot laboratory, located in the control house, for accommodating student classes in sanitary engineering and for sewage-treatment research being carried on by the college. The operation of the plant will be a responsibility of the city, but the college and city will both benefit from this cooperative arrangement.

The design of the plant was by the Howard R. Green Company, consulting engineers, of Cedar Rapids, Iowa. The construction was by Lippert Brothers of Boone, Iowa, and inspection by the Engineering Department of the City of Ames.

New Tri-City Airport Terminal

PHOTO COURTESY CALL-CHRONICLE NEWSPAPERS, ALLENTOWN, PA.

Simple, severe lines add to the attractiveness of the Allentown-Bethlehem-Easton (Pa.) airport terminal building. The names are in raised aluminum letters. Aluminum was also used for the decorative cornices, spandrels, and window trim. The airport was designed by Michael Baker, Jr., Inc., consulting engineers, of Rochester, Pa. It is operated by an authority formed from the three towns. An article describing the authority appeared in *The American City* for December 1950 on pages 130-131.

Municipal
Public
Relations

The City Tells Its Story

By HENRY DAVIS NADIG . .
Executive Director, Association of Municipal Public Relations Officers

Municipal public relations in civil defense: important opportunity

NEVER has MPR been given such a rich opportunity, all in one swoop, to prove its purpose, its value, and its place in municipal government, as it has today in connection with civil defense at the local level.

MPR can accomplish three major objectives for civil defense: (1) Organize the production and dissemination of material to the public, (2) establish a thorough and adequate information center and, (3) awaken the public to alertness through specific educative techniques.

In addition to this threefold service, MPR may at the same time effectively create a new consciousness of public relations on the part of all local officials and thereby increase its own peacetime potential.

Communication Basic

Communication is an essential of civil defense. Obviously, first of all, there must be communication between the CD officials and the volunteers who are to be trained and drilled in the many different activities necessary to establish a smooth-working CD operation. Second, there must be the proper kind, the most intelligent type of communication among the several functioning units of the civil-defense organization. Third, an efficient and effective communication to the whole public must be achieved by civil defense in order to have full and understanding public cooperation and action in emergency.

The first two requisites are inherent in the civil-defense law and operational setup. It is implicit that CD officials and volunteers will be trained in the art of speedy and proper communication among themselves. This is a job to be carried forward within the CD setup itself.

But not everybody will be serving in a particular civil-defense group — at least for a time. It is one of the biggest of CD tasks to acquaint the nonparticipating citizens—of all ages—with the purposes, functions, and importance of the civil-defense setup in all its phases.

It is with this third requisite—communication to the general public—that MPR can especially concern itself and where it can be of most service. This is so because it is fundamentally MPR's job to inform the public on the activities of local government—and civil defense is now a *major* activity at the official local level.

Where MPR setups are already functioning, either under the name of Municipal Public Relations or under another name or under no name at all, MPR men are moving forward to tie in their services, their office, for the best interests of civil defense. They will speed up the employment of their techniques, their media, for the most efficient development of a smoothly operating CD setup in their municipalities and for the best possibly informed local public.

Those cities and towns already possessing official MPR operations have the jump on the "have-nots." Ready-made for the new local civil-defense organization is a working information arm which can be called upon immediately for getting to the public mind the CD information that is essential to all citizens. The know-how, the technique, and the tools are ready for the using. The CD officials in an MPR town should be able to overcome very quickly any public apathy regarding civilian defense.

But in most towns and cities there is as yet no official MPR setup in the local government. The process of officially informing the public about local government is a haphazard, scattered, and largely ineffective job.

Here the problem of awakening the public from its apathy on civil defense cannot be tackled with immediate results. For, if there has been lack of understanding about MPR and its functions and failure to profit by its democratic operation and objectives, only some happy accident can swing a CD campaign into true public appreciation and perspective.

What to Do?

What, then, are the local-government officials—the mayor, the city manager, the village chairman—to do? What is the chief CD officer to do? Facing them is the problem not only of whipping into shape a well-organized, well-trained CD corps—a major task in itself, but also the equally important problem of rousing an apathetic public to CD consciousness. There are three alternatives:

1. An MPR department can be created in the local government, charged with the responsibility of handling public relations not only for the normal peacetime activities of officials and departments but also for the civil-defense setup; or—

2. The chief CD officer or the municipal chief executive sets up a civilian-defense information section, devoted, of course, strictly to communicating CD information to the public; or—

3. The matter of disseminating information on civil defense to the public can be left to happenstance: it can be just as purposeless, uncoordinated, and haphazard as previous information on local government.

Regardless of how you may plan to handle this problem, there are certain information needs or requirements inherent in the civil-defense operation, based upon the fact that knowledge of what CD does, how it operates, and where the public fits in must be communicated to the public.

These needs include: a whale of a lot of *local* safety information — countless details which logically are not contained in state or federal CD literature; graphic material in connection with directions for action in various types of emergencies, tied in with local geography; public recognition of the functions of different CD units; public respect for and cooperation with these

How's Your MPR in Civil Defense?

WHAT is your municipality doing to rouse public interest in civil defense? Are you moving to set up a public-relations arm either for CD or for your municipality to aid civil defense?

The Association of Municipal Public Relations Officers would like to know about it and would be glad to cooperate wherever possible.

Write details to: Henry Davis Nadig, Executive Director, AMPRO, 341 Madison Avenue, New York 17, N. Y.

units; public recognition of various insignia; general public awareness and alertness—to mention a few demands upon the public relations phase of CD.

None of these things is going to be accomplished overnight. It will take some doing.

First objective of MPR in civil defense is to organize the production and dissemination of information material to the public. Both state and federal literature will be available. How is it to be distributed, haphazardly or purposefully? With or without local printed tie-ins? Is the material to be dumped upon the public or is it to be put out with well-organized method, so that each packet will be successively effective? What branches of CD are to be covered first? What phases need special treatment and repeats? What shall be done through press, radio, and television?

These are questions — problems — whose answers can be given best by someone skilled in public relations working together with the CD officers. For the best kind of CD results—for obtaining a cooperative public, these problems must be met and solved expertly.

This is the phase, or operation, under which the public is "merely exposed" to CD material by mail or direct distribution to groups or house to house.

Information Center

As its second objective the public-relations arm of civil defense sets up a central CD Information Center. This center serves a threefold purpose: (1) it provides a central office from which both printed and verbal information may be sent or given out systematically; (2) it acts as a focal point for the public query, eliminating nuisance, duplication, and confusion, and (3) it contributes to intra-CD morale by virtue of its coordinating, streamlining influence.

Quite obviously, without such an information center there is going to be plenty of confusion: a good many misunderstandings both inside and outside CD and lack of a thoroughly and properly informed public.

Under this phase of the MPR operation, the interested public may come and get information — correctly and fully—as it chooses.

But for the most part, while a vast segment of the public may be exposed to literature and news about civil defense and some will "come and get it," a real job remains to be done on those hundreds or thousands who take too much for granted and who always have been inclined to "let George do it."

In its third objective, therefore, CD's MPR moves in on the public with a consciously designed program of PR educative techniques intended to wake up Johnny Q. on his very own behalf. This it does through purposefuily scheduling speakers at civic, community, and neighborhood meetings; through movies, press, radio, and TV, in specially developed presentations; through alerting special interests of individuals and groups and tying them in with CD is a problem of dramatizing CD so appealingly that citizens will want to play an active part in the CD program.

Through these and other techniques, MPR can be the right arm of civil defense. But MPR can do a consummate job only if it operates on top level—in the councils of the top local CD setup. MPR is not a choreboy. But, working at executive level, it can accomplish a lot of chores highly important to civil defense—chores which, without good MPR, are burdensome to the inexperienced and uninitiated and thus rarely, if ever, fully accomplish their purpose.

Establishment of an MPR setup in civil defense, lastly, may be salutary o far as local governments now without MPR are concerned. This is a hoped-for outcome after the current unpleasantness becomes a thing of the past.

Keen local-government officials, observing the operations of MPR on behalf of their municipality's official civil-defense program, will grasp the significance of MPR and realize what it can do for government as an official arm of the municipality. They may take action, then, to achieve the public support and the economies which are inevitable through efficient MPR operations.

New York City's defense poster distributed by the Consolidated Edison Company.

By SHIRLEY F. WEISS, *Planning Economist*
Harrison, Ballard & Allen
New York, N. Y.

Minimal codes controlling the facilities and occupancy of existing dwellings are needed to supplement local building and zoning codes which control the erection of new buildings, conversions, and additions

Cities Boost Minimal-Housing Standards in 1950

OVERCROWDING of dwellings, inadequate provision of light and air, insufficient protection against fire, and improper sanitation facilities are being recognized increasingly as a menace to the health, safety, morals, and general well-being of city and rural dwellers. During 1950, local housing codes setting forth minimal standards for existing dwellings were adopted by four additional municipalities: Portland, Ore.; Newark, N. J.; Wilmington, Del., and Richmond, Va.

To a large extent, the new codes lean heavily on those previously enacted and enforced by eight other cities widely scattered throughout the United States: Baltimore, Md.; St. Louis, Mo.; Milwaukee, Wis.; Cincinnati and Toledo, Ohio; Denver, Colo.; and Charlotte and Greensboro, N. C. In addition to these, there are a number of communities (including Louisville, Ky.; Flint, Mich., and at least seven towns in Massachusetts) which operate under state enabling acts authorizing the enforcement of housing standards.

The cities of New York and Philadelphia have strong enforcement laws relating to certain types of dwellings, although they do not yet have comprehensive minimal-housing codes as do the dozen cities cited above. It is gratifying to note that three additional cities are currently considering the enactment of minimal standards (Columbus, Ga.; Kansas City, Mo.; and Norfolk, Va.), and that another (Minneapolis, Minn.) is reviewing its current housing ordinance with a view to enforcing more fully the existing health and construction regulations.

On the basis of the definition of the National Association of Housing Officials, minimal-housing codes included in this survey cover "health and safety standards below which existing housing will not be accepted in the community." It should be noted that these codes do not duplicate or supersede local building and zoning codes, which are designed to control the erection of new dwellings, conversions, and additions. As a realistic approach to the problem of maintaining the quality of housing, the "minimal" codes and building codes may be said to provide a system of dual standards for dwellings already standing and those on the drawing-board.

Classification of Housing Codes

With the exception of the Cincinnati housing regulations, which were included in its 1933 Building Code, the housing codes reviewed herein have all been adopted since 1942. They fall into two definite categories, those enforced by the health department and those enforced by the building inspector. The former represents the newer type, originally adopted by the City of Baltimore and since followed by Milwaukee, Toledo, Newark, Wilmington, and Richmond. Where the health department is given the responsibility for enforcement, the health commissioner is generally authorized to issue specific rules and regulations, setting forth minimum acceptable standards. However, there appears still to be a lack of common agreement on such policy questions as rule-making authority, repairs by enforcing agencies, vacating and demolition powers, and extent of penalties. Obviously, these questions must be resolved by the individual municipalities, according to local needs and pressures.

Minimum Standards Raised

Review of the existing comprehensive minimal-housing codes reveals that the following facilities and conditions of living are considered basic by more than one city, in addition to the more general standards of cleanliness, soundness of structure, weather-proofing, drainage, and reasonable repair: (1) window in each habitable room; (2) installed sink and running water; (3) inside water-closet; (4) bathtub or shower; (5) electricity throughout: (6) separate access; (7) dual egress; (8) damp-proof basement rooms; (9) limitation of overcrowding, particularly in sleeping rooms; (10) rat-proofing and removal of outside structures; (11) screens, and (12) garbage cans.

1.

The minimum size of window area is specified generally as 10% of the floor area in each habitable room. The window opening is required, in most cases, to be one-half of the total window area, or 5% of the floor area.

2.

An installed sink and running water are required generally. The standards vary from one sink for every dwelling unit to one sink for every two dwelling units. For this requirement, Baltimore, Wilmington, and Richmond classify a dwelling unit as two or more rooms.

3.

A ventilated water-closet, installed inside each structure, is uniformly required. Provision of facilities varies from one for every dwelling unit, two dwelling units, or three one-room apartments, to one for every 10 persons.

4.

Only three cities require an installed bathtub or shower for each dwelling unit: Milwaukee, Toledo, and Charlotte. All three codes have been adopted since 1945. Apparently the requirement of bathing-facilities in minimal-housing codes is still very limited, as none of the codes adopted in 1950 incorporates this standard.

5.

The specification of electricity throughout each dwelling unit is another standard which has appeared since 1945. Four codes require that electric outlets be provided in every habitable room, bathroom, other room, passageway, and stairway, where electricity is available from the street, alley, or lines near the dwelling. These cities are St. Louis, Milwaukee, Toledo, and

Charlotte. It is interesting to note that none of the codes requires illumination of off-street entranceways.

6.

Separate access for each dwelling unit, either via hallway, landing, stairway, or street, is required by Baltimore, Denver, Toledo, Wilmington, and Richmond. It should be pointed out that specifications for access and egress have long been thought of as part of fire codes, and that their exclusion from minimal-housing codes does not necessarily mean that they do not appear in other codes enforced by the cities.

7.

Dual egress is not included as a requirement in most housing codes. Two cities, however, have incorporated this important safety factor in their minimal-housing standards. St. Louis requires dual egress for all dwelling units above the second story, and Portland requires it for dwelling units above the first story, in multiple dwellings.

8.

Habitation of basement rooms is generally ruled out, unless the rooms can be adequately lighted, ventilated, and dampproofed. The height of basement rooms is required to be 7 to 7½ feet, with 3 feet or more above grade level.

9.

Limitation of overcrowding is particularly emphasized for sleeping rooms. Charlotte requires that the first bedroom have a minimum area of 100 square feet, and additional bedrooms a minimum of 70 square feet. St. Louis specifies a minimum area of 60 square feet (40 square feet per person) for sleeping rooms, and Toledo, 50 square feet.

A number of codes set minimum standards of sleeping area for adults and children, in terms of air space and/or floor space. Baltimore, Wilmington, and Richmond require 400 cubic feet and 50 square feet per adult, and 200 cubic feet and 30 square feet per child under 12, with a minimum room of 60 square feet. Newark specifies 400 cubic feet per adult and 250 cubic feet per child under 12, whereas Portland calls for 400 cubic feet per adult, 300 cubic feet per child 6 to 12, and 200 cubic feet per child under six. Cincinnati, which predates the more stringent housing codes, requires 275 cubic feet per person for rooms occupied by more than two persons.

Occupancy of habitable, non-sleeping rooms is generally limited to 1½ to 2 persons per room, with children 1 to 12 being counted as half a person. Some codes specify a minimum room area of 65 to 75 square feet per adult. Charlotte does not limit the number of occupants, but requires instead that the principal room of each dwelling unit have a minimum area of 150 square feet.

10.

Elimination of rodent infestation is required in all the codes, specifically or by inference. To facilitate extermination of the rat population, the Baltimore City Health Department has instructed owners to dig up all nests and burrows, to cement cellars and seal them off with masonry walls, and to close all rat-holes and openings around pipes with concrete or sheet metal; to flash exterior doors at base with 6 inches of sheet metal; to screen cellar windows and vents with ½-inch-mesh hardware cloth; and to close with concrete any openings through which rats might gain access into the structure.

Deteriorated outside structures are known to harbor rat populations. For this reason Baltimore requires that all yard toilets be removed, as well as dilapidated summer kitchens, frame additions, fences, window shutters, sheds, outbuildings, and porches. St. Louis specifies that water-closets outside habitable buildings and privies be eliminated by 1954. Cincinnati requires that all privy vaults, catch-basins, outside toilets, and cesspools be completely removed. The proposed Norfolk code would eliminate outside water-closets and privies, beginning two years after the effective date of the ordinance. Removal requirements of this type are not specified in the other codes reviewed.

11.

Only three codes (Milwaukee, Toledo, and Charlotte) require that screens be provided for all doors opening to the exterior of the dwelling, and for at least one window in each habitable room and basement. It is noteworthy that these cities are the same ones which require a bathtub or shower for each dwelling unit. Both these standards are evidently indicators of the more stringent type of housing code. Newark requires that wherever screens are provided by the owner, they be kept in serviceable condition, and that adequate window and door screens be provided for dwellings hereafter constructed. The proposed Norfolk code also requires screening.

12.

Baltimore, Wilmington, and Portland require that every dwelling unit be provided with a water-tight garbage receptacle, made of metal and fitted with a cover. The proposed Kansas City code also has this requirement. The other codes generally require some receptacle for refuse and ashes.

From the numerous published reports of the Baltimore Plan, it is apparent that minimum housing standards can be effectively enforced. The Baltimore Health Department notes that since 1945 it has inspected some 5,000 dwelling units, and has corrected 108,000 violations within the past three years.

The success of Charlotte (1950 population, 133,219) is particularly encouraging from the point of view of medium-size and smaller cities. Under the jurisdiction of the Building Inspector, the enforcement program has been responsible for bringing up to standard more than 4,450 units within two years, and demolishing an additional 500 unfit dwellings. The city has gained more than $3,000,000 in assessable values through this program, besides providing safer and more healthful housing accommodations for the underprivileged.

It is apparent from this brief review that minimal-housing codes can serve a very important function in bettering living conditions in salvable residential areas. In conjunction with slum clearance, private and public redevelopment, and low-cost housing programs, the minimal-housing codes provide an effective means for improving the quality of existing housing in the United States.

EDITOR'S NOTE: Municipal officials interested in improving standards for minimum housing would also do well to read the following three publications: *Basic Principles of Healthful Housing.* Committee on the Hygiene of Housing, American Public Health Association, Inc., 1790 Broadway, New York 19, N. Y. Second Edition. Reprinted 1950. 34 pages. 50 cents.

An Appraisal Method for Measuring the Quality of Housing: A Yardstick for Health Officers, Housing Officials and Planners. Part II. Appraisal of Dwelling Conditions. Volume A. Survey Director's Manual. By the Committee on the Hygiene of Housing. 1946. 105 pp. $2.50.

Planning the Home for Occupancy. Committee on the Hygiene of Housing. American Public Health Association. Public Administration Service, 1313 East 60th St., Chicago 37, Ill. 1950. 56 pp. $2.50.

National Institute of Municipal Law Officers Elects New Officers

AT THE Annual Meeting of the National Institute of Municipal Law Officers held in New Orleans, November 27 to 29, 1950, the following officers were elected to serve for the ensuing year:

President—William H. Emerson, Corporation Counsel, Rochester, N. Y.

First Vice-President—Thomas N. Biddison, City Solicitor, Baltimore, Md.

Second Vice-President—Alton H. Skinner, City Attorney, Kansas City, Kans.

Treasurer—N. F. Keller, City Solicitor, Waynesboro, Pa.

Trustees—

Robert D. Morrison, City Attorney, Lynchburg, Va.

Alexander G. Brown, City Attorney, Portland, Ore.

Anne X. Alpern, City Solicitor, Pittsburgh, Pa.

Herman C. Wilson, City Attorney, Greensboro, N. C.

Walter J. Mattison, City Attorney, Milwaukee, Wis.

Ray L. Chesebro, City Attorney, Los Angeles, Calif.

Joe W. Anderson, City Attorney, Chattanooga, Tenn.

David M. Proctor, City Counsel, Kansas City, Mo.

Charles Handler, Corporation Counsel, Newark, N. J.

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listing by subjects and by cities the articles and items published in *The American City* for the 12 issues for 1950 will be available without charge to subscribers for the magazine. Address requests to 470 Fourth Ave., New York 16, N. Y.

Urban Progress in Latin America

By ANATOLE A. SOLOW, *Chief, Section of Housing and City Planning, Pan American Union*

"Point IV" technical assistance to help people help themselves

THE United States is now ready to put into operation, on a world-wide scale, an undertaking of great significance and even greater simplicity . . . the Point IV Program seeks the simple basic thing of helping our neighbors to help themselves.

With these words Ambassador C. M. Waynick, Acting Administrator of the Technical Assistance Program, opened an important address on September 13, 1950, outlining the objectives and scope of the much-talked-about Fourth Point of President Truman's Inaugural Address of January 20, 1949.

Administrators and technicians who have worked for two years on the preparation of the program will accept Mr. Waynick's statement that the program is of great significance, but they may disagree that it is of great simplicity. The basic idea is, of course, admirably simple: to help economically and technologically less-developed countries to apply technical know-how to all phases of social and economic life, to bridge the gap between prevailing practices and available knowledge, and to raise, in this manner, the standard of living for millions of people. In President Truman's own words: ". . . our aid should be to help the free people of the world, through their own efforts, to produce more food, more clothing, more materials for housing, and more mechanical power to lighten their burden. . . ." The implementing of such a program, however, requires a vast reservoir of technical and scientific personnel in all fields, machinery and equipment, and capital.

The Point IV Program became law in 1950 with the enactment of U. S. Public Law 535, the Act for International Development. Although financed principally with American funds, every dollar put into this program will do more than a dollar's worth of work, because it is a cooperative program to which many countries will contribute. Out of $34,500,000 appropriated, $12,000,000 is allocated to the United Nations. One million will go to the Organization of American States for cooperative inter-American research, training, and education centers. Technical assistance programs of such international and regional agencies as the United Nations and the Organization of American States are multilateral in character, i.e., financed and executed jointly by groups of countries. The remaining funds will be used for direct bilateral projects between some 20 United States Government agencies and individual countries, in order to continue and expand programs already under operation, principally in Latin America.

The program is conceived in two parts: (1) to provide technical assistance in the form of professional experts, educational material, training of specialists in agriculture, industry, health, sanitation, resources development, housing, etc., to those countries which request such services; and (2) to encourage private capital investment in those countries. The sort of service contemplated is, of course, not a novelty. The Rockefeller Foundation has been providing similar leadership in the health field for many years. The United Nations and its specialized agencies have already begun the provision of technical assistance to under-developed areas, such as is done in Haiti, for example.

Government agencies, including the Department of Agriculture and the Public Health Service, have been sending experts and technical missions abroad for many years. However, in housing and urban planning, international technical assistance is of relatively recent origin. The Housing and Home Finance Agency has sent consultants to advise the Haitian Government. The United Nations has recently sent a mission of experts to study tropical housing in India and other areas of the Far East. In Latin America the Housing Section of the Pan-American Union has helped to establish housing and city-planning programs in Costa Rica, Guatemala, and El Salvador. The Ecuadorian Government has requested from the Pan-American Union a mission of planning and housing experts to advise on the reconstruction of communities destroyed or damaged by the 1949 earthquake.

Problems of Interest

In recent years, housing and urban-development problems have increasingly interested governments of Latin-American republics. A Pan-American Union study (Low-Cost Housing in Latin America) estimated, in 1947, that there were about 25,000,000 slum or sub-standard dwellings in urban and rural areas of Latin America. Thus, at an average of five persons per family, the shortage of housing may affect as many as 125,000,000 people—two-thirds of the population. One way in which this vast problem can be attacked is by increasing the productive facilities inherent, but not adequately developed, in the countries south of the border. This applies to better utilization of local natural and human resources, expansion of building-materials industries,

The Point IV program of technical assistance opens vast possibilities to promote betterment of housing and urban planning in the Western Hemisphere. Since this program is undertaken through the leadership of the United States, it offers many new opportunities to planners in this country, but it also places a heavy responsibility upon them. There is urgent need for top American technicians in city planning, reconstruction, housing administration, and related fields, who are willing to accept assignments abroad. Essential qualifications are a knowledge of languages and the ability to understand fully the social, psychological, political, and economic realities of the countries of Latin America, and to adapt rather than to transplant American techniques to a different environment.

and application of technological and scientific advances in design and construction. It is here that Point IV can play a major role. Take, for example, the production of cement, a basic material not only for housing, but also for public works in general. The Pan-American Union study mentioned above estimated that in 1947 the Latin-American productive capacity was 0.43 kilograms per capita (as compared to 140 kilograms per capita in the United States), while the consumption rate was 15 kilograms per capita and is growing rapidly. Consequently, that vital material must be imported not only at high cost but at the loss of valuable dollar currency. In the last 10 years cement production has almost doubled in Argentina, Brazil, Colombia, Mexico, and Venezuela, the five largest countries of South America, from a total of 202,800 tons in 1939 to 393,600 in 1949. Colombia is even exporting cement to the United States. Yet there is still a vast opportunity for expansion in cement production, and in such smaller countries as Ecuador, El Salvador, Costa Rica, and Honduras, plants are either under construction or in the project stage.

Four Major Activities At the International Level

Under the Point IV program in housing and urban development, four major activities are contemplated at the intergovernmental level: (1) sending experts to advise governments in technical and administrative problems when setting up their national housing programs; (2) making available housing and planning experts to participate in group missions for area-development projects; (3) bringing students and professionals from Latin America for in-service training and advanced study in the United States or Puerto Rico; (4) participating financially on a joint basis with other countries to establish and support research and training stations in Latin America and other parts of the world.

Among specific projects the Pan-American Union—General Secretariat of the Organization of American States—proposes the establishment in 1951 of an Inter-American Housing Research Station for testing and developing building materials, construction methods, and dwelling design. Emphasis is to be given to the utilization and improvement of local materials such as native woods, minerals, and fibers, and to the development of "self-help" methods of construction. The research station is also to be used for in-service training of fellowship students from all American countries, and expert staff members of the station will serve as consultants to individual governments upon request. It is believed that the work of the research station will lead to reduction of housing production costs, development of improved building materials, more effective utilization of local resources, and improved dwelling design. The project has received enthusiastic support from many housing technicians and official housing agencies of the member nations of the Organization of American States.

A Program of Technical Cooperation Proposed

In April of 1950 the Inter-American Economic and Social Council, one of the organs of the Organization of American States, proposed a program of technical cooperation under Point IV to be executed by the Pan-American Union and by other recognized Inter-American agencies. On December 12, 1950, the Council passed a significant resolution selecting three projects for immediate initiation from a list of 46 projects. Among the three projects with top priority is Technical Assistance Project No. 22: A Housing Research and Training Station. The fact that the housing-research station was selected among the very first projects indicates the great concern of the American governments with the problem of housing and the recognition that technical assistance in that field is urgently needed and desirable.

The center will be established in one of the member countries of the Organization of American States, where some facilities already exist which could offer a basis for economical and speedy beginning of the work program. The center will have its own technical research and teaching staff. The Pan-American Union will act as administrative and coordinating agency through its Section of Housing and City Planning. The budget for the first year is estimated at $66,000, and will be increased in subsequent years. The duration of the project under the technical-cooperation program is proposed for five years, and if it proves of practical value it may be continued.

A second project, supplementary to the first one, but not yet approved by the Inter-American Economic and Social Council, contemplates the establishment of an Inter-American Institute for Advanced Studies in City Planning, following the pattern of Massachusetts Institute of Technology, Columbia, and Harvard city- and regional-planning training. The institute would provide courses leading to a postgraduate degree for students sent from all American countries under fellowships provided by technical-assistance funds. Although most Latin-American countries are predominantly agricultural, they are now at the threshold of an expanding industrialization and their cities are growing at a phenomenal rate. Indeed, many countries consider industrialization as the key to economic stability. At the same time they have not yet fully realized the absolutely essential role of orderly urban growth as a basis for industrial, economic, and social progress. Although city planning and housing have been recognized as proper fields for specialization, in many Latin-American countries professionals in these fields are as yet lacking, and there are not enough training facilities. Owing to their relatively small size, some countries are not in a position to establish by themselves advanced training schools. Consequently, it is felt that the institute proposed by the Pan-American Union will meet an urgent and practical need.

New Extensions for Fitchburg, Mass.

A new 8-inch water main will go into this trench, which is being excavated by the Fitchburg (Mass.) Water Department with its Model TLDT-20 Michigan truck-mounted power shovel. The shovel is being operated as a back hoe for this work. It can be transformed quickly into a standard power shovel or crane.

Performance-Type Building Code Now Available to All Communities

By GEORGE E. STREHAN
Consultant
Building Officials Conference of America
New York, N. Y.

AS EVERY building-code commission knows, the writing of a building code is a costly and time-consuming project. The prohibitive expense involved makes it impractical for any but a few of the larger cities or states to undertake the task. These individual efforts when they eventually bear fruit may satisfy the demands of local prejudice and pride, but the question may well be asked, "Do they attain the desired objective?"

Supplementing the thousands of diverse codes now in use and the feverish efforts of cities, counties, and states across the nation to make their own, there are still some 15,000 towns, villages, and boroughs without the benefit of adequate building laws or with no code at all. Duplication of effort lacks the essential element of uniformity in requirements. Unrestricted control is now breeding future blighted areas in many communities. Both approaches lead to waste and extravagance with inevitable high costs to the public.

THE program of the Building Officials Conference of America for building-code reform was born of the need for a good workable instrument to be administered by the active administrative officials across the country and was conceived in their daily experience in safeguarding the public from the ills of unsafe and unsound building practices. The two service instruments in this program, the Abridged Building Code and the Basic Building Code, were prepared in three preliminary drafts with the active participation of material manufacturers, skilled builders and tradesmen, and experienced engineers and architects. After extensve public hearings and review, the BOCA codes are now available to every state, county, or municipality in their first printed edition. They are modern, flexible, performance-type building codes which can be adopted by reference in any municipality under the respective state enabling acts. They embody the best thought of practical building officials who are in daily contact with the problems involved and who are responsible for the safety and welfare of their fellow citizens as affected by building construction.

The BOCA codes seek to provide minimum essential requirements for safe and sound buildings. They are aimed at eliminating all prevalent malpractices which lead to faulty construction and expensive maintenance. They are not aimed at either up- or downgrading the building laws in the interests of any particular pressure group. Being based on performance requirements, they give latitude to the ingenuity of the qualified engineer and architect and the know-how of the manufacturer and builder to utilize new developments. They recognize all accredited test procedures and approved performance standards for which building research has made the necessary technical data available. Analysis of representative city and township building codes across the states reveals not less than 200 critical and restrictive requirements which now obstruct economical and safe construction.

The preamble to the Basic Code describes the machinery provided through the Structural Bureau of the Building Officials Foundation to insure unified administration of building laws and national approval of building materials. This agency, cooperating with the Material Approvals Committee of the Building Officials Conference, will publish approvals of materials and equipment which meet the performance requirements of the Basic Code. Approval cards will be furnished to all building officials and administrative autorities operating under the BOCA codes. The detail specifications of all such approvals will be incorporated in the loose-leaf "Construction Code" which will be issued at regular intervals as the approved rules and regulations are developed.

To maintain the BOCA codes in step with developments in the industry, a Code Changes Committee will consider all applications for proposed revisions of the laws. After report by the Committee and due notice by publication, changes will be voted on by the General Conference, and approved changes will be published in the official magazine, which has national circulation. It is planned to publish revised editions of the printed codes every three years.

New Concepts Contributed by the BOCA Codes

To attain the objectives of the BOCA-BOF program, many new concepts are contributed by the BOCA codes, of which the following are some of the highlights.

● *Terminology*—New terms have been introduced to bring the codes in line with modern concepts in construction and safety requirements. The term "Use Group" defines the classification of a building with respect to the purpose for which it is used. The term "Occupancy Load" defines the number of individuals who may occupy the building and for which the exit facilities are designed. The term "Fire Separation" defines the exterior fire exposure as the distance in feet measured from any other building on the site, or from an interior lot line, or from the opposite side of a street or other public space to the building. Insofar as the work of the Joint Committee on Unification of Building Codes has progressed, definitions and terminology of the code follow the recommendation of that national committee.

● *Building Classification.*—A comprehensive tabulation of "Use Groups" of buildings defines 17 separate classes in Table 6, representing groups of equal inherent fire hazard, together with a tabulation of "Fire Grading" expressed in equivalent hours of time-temperature performance in Table 19. These determinants fix the required fire-resistance ratings of fire divisions and fire walls between mixed occupancies and between buildings.

● *Construction Classification.*—Methods of construction are classified in four basic types with a total of 10 subdivisions, to cover the full range of both traditional and new construction methods.

● *Fire Protection of Structural Elements.*—Table 5 assigns time-temperature performance requirements to each structural building element in all types of construction. Exterior fire resistance of enclosure walls is regulated by the fire separation from lot lines or adjoining buildings and

varies from 45 minutes to 4 hours, dependent upon the exposure hazard. The required interior rating is determined by the fire grading of the use group.

● *Fire Resistance and Flame Resistance.*—For the first time in building codes, test standards are specified to govern both phases of protection against fire hazard. The fire resistance of materials and assemblies or resistance to penetration of fire is governed as heretofore by the Standard Fire Test. Flame resistance, which defines the tendency toward spread and communication of fire by surface transmission, as illustrated in the flash-fire hazard, is regulated by one of three alternate standard test procedures measuring the fuel value, the flame spread, and the combustibility of the material involved.

● *Fire-Resistance Ratings.*—The traditional 1-hour fire-resistance requirement is reduced to ¾ hour. This permits the use of many available assemblies which would be ruled out by the more rigid requirement and yet furnish adequate fire safety for the specified condition of use.

By introducing ½-hour protection for the frame building, the code decreases one of the most prolific sources of fire hazard in the one- and two-family dwellings, which accounts for the greatest annual life loss from fire.

● *Emergency Fire Ventilation.*—The Basic Code proposes a system of emergency fire ventilation consisting of vertical vent stacks and horizontal collecting ducts in public corridors and exitways of buildings of the institutional, residential-apartment, and hotel groups to reduce the severe life hazard resulting from the rapid spread of lethal gases and smoke in the event of fire.

● *Panel Walls.*—Criteria for the acceptance of non-load-bearing panel walls in skeleton construction are based on performance requirements of the assembly in fire resistance, weather resistance, and wind resistance. This permits the modern assembly of light-weight combustible insulating materials with weather-resistant coverings which meet the required fire resistance, varying from a minimum of ¾ hour to a maximum of 2 hours, without thickness limitations.

● *Height and Area Limitations.*—In order to approximate a uniform degree of fire safety in the community, limiting heights and areas are regulated by Table 6 for all the specified types of construction and all use-groups of buildings. The solution is based on a "use factor" developed from statistics of actual fire experience of the use group and a "construction factor" representing the factual fire resistance of the type of construction. The tabular areas are permitted in buildings that have a minimum frontage of 25% of the perimeter of the building on one public street. The code provides for increased areas when greater building frontages are accessible for fire-fighting or when provision is made for special automatic fire-extinguishing equipment. Unlimited areas are permitted in one-story industrial buildings outside the fire limits, under specified fire-separation and adequate exit facilities.

● *Loads and Stresses.*—Design live-load and structural-stress requirements are liberalized to conform to accepted egineering practice. The use of high-yield steels as well as light-gauge steel and light-weight metals and alloys are provided for in structural design. If not capable of design by accepted engineering analysis, test procedures are prescribed to establish safe working loads for all structural assemblies. In an appendix to the code, a complete table of weights of materials is presented to furnish a basis for uniform design practice across the country.

Controlled Materials, Exitways, Service Equipment

● *Controlled Materials Procedure.*—Under this procedure, specified in detail in the Basic Code, freedom is afforded to the designer in the use and working stresses of materials within the limitations of accepted engineering practice. When materials and procedure are not so controlled, allowable working stresses are generally penalized 10% below the recommended values of recognized standards.

● *Exitways.*—The code provides for the use of all modern developments in exitways and exit devices, including revolving doors, moving stairways, manlifts, and other conveying devices. Under specified conditions, occupancy loads are increased for approved elevator equipment.

Special provision is made for the protection of open wells of moving or electric stairways, including a power-operated automatic shutter with emergency smoke detector and rate-of-rise temperature controls to restrict the spread of fire and smoke.

A recent test conducted (on November 28, 1950) for the Structural Bureau of the Building Officials Foundation, under the provisions of Secs. 522 and 1622 of the Basic Code, proves this device to be an effective barrier against the spread of fire and smoke for a period of 1½ hours when subjected to the Standard Fire Test.

● *Building Service Equipment.*—The Basic Building Code includes provisions governing the building-service equipment essential for safe and livable occupancy in all building use-groups. In view of the pending report on plumbing regulations of the National Joint Committee, under the Chairmanship of Dean Francis M. Dawson, of the University of Iowa, which is to be issued in 1951, Article 17 of the Code, entitled "Plumbing, Drainage and Gas Piping," was presented as an interim document. It will eventually be revised by the Code Changes Committee to conform to the approved National Plumbing Regulations.

Arrangement

Following the arrangement recommended by the Correlating Committee of the American Standards Association, the code consists of 19 Articles, including additional provisions under the headings of "Refrigeration," "Air Conditioning," and "Prefabrication." In the manufacture of prefabricated units and assemblies, the use of "Controlled Materials" procedure provides a solution for administrative control and permits greater latitude in the use of industrialized shop production methods. All the quality, design, and test requirements of the code apply equally to both at-site and prefabricated construction.

In applying performance standards, all competent previous tests, specifications, and standards of authoritative technical and testing organizations are accredited. These accepted engineering-practice standards are listed in the appendices to the Basic Building Code by author, title, and date of adoption. In the Abridged Building Code, fire-resistance ratings are included for all common materials and assemblies used in wall, partition, column, floor, and roof construction. This grouping of references to standards of accepted engineering practice in the appendices simplifies the process of amendment as the sponsoring organizations promulgate revisions from time to time.

Both the 1950 printed editions of the ABC and the BBC can be secured from the Building Officials Foundation, Room 1401, 51 East 42nd St., New York 17, N. Y. Single copies of the codes are priced as follows, with a reduction for orders in quantity: Abridged Building Code (119 pages), paper cover, $3.00; cloth cover, $4.50. Basic Building Code (370 pages), paper cover, $5.00; cloth cover, $6.50.

Both codes have been copyrighted and are held in type. Arrangements can be made for printing special editions in quantity through the Foundation, with such modifications in the text and changes in the title page and cover as may be desired.

New Deadline for Federal Slum-Clearance Aid

THE Housing and Home Finance Agency has extended by six months, through June 30, 1951, the time in which communities may request initial reservations of capital-grant funds for slum-clearance and urban-redevelopmentment projects under Title I of the Housing Act of 1949.

The Agency has also provided for increases in initial reservations which will be approved for communities as they need additional capital grant funds to undertake specific projects.

The amount of the aggregate of $500,000,000 in capital-grant authorizations in Title 1 of the Act which is not earmarked for initial reservations will be made available for these supplemental reservations.

To date more than 230 communities have received approval of requests for initial capital-grant reservations totaling more than $170,000,000.

The submission of a request for reservations of capital-grant funds is the first step of a community toward participating in the slum-clearance and redevelopment program authorized by the Act. A reservation sets aside, for a community capital grant, funds which subsequently may be used by a community to pay up to two-thirds of the deficit incurred in acquiring, clearing, and disposing of a slum site. Federal loan and grant assistance authorized in the Act will be made available only to communities for which capital-grant reservations have been made.

Granddad Still Runs Too Many Fire Departments

By H. R. CHASE, *Chief*
Division of Fire
Miami, Fla.

WHILE THE fire service has naturally changed in many ways in the last 20 or more years, progress has been pretty deliberate. Even the automotive age was slow in being accepted. Some cities waited a long time before changing from horse to truck. The first automobiles used in the fire service were equipped with solid tires and Chief "Granddad" didn't believe in them. Then came the fire chief with the idea that windshields would be an advantage, and he also took a lot of ribbing, for the Granddads said that windshields were dangerous and they would not equip their apparatus with glass that would cut a man all to pieces when there was a wreck. But again, windshields and the fire chief with vision won out.

A 900-gpm Elkhart fog nozzle placed on a Multiversal nozzle demonstrates the ease in which a large volume of fire can be controlled. With 4,000 square feet of wood partitions that had been burning for five minutes, and the use of approximately 500 gallons of fog for a half-minute discharge time, the fire was completely extinguished. The temperature had reached 1,650° F. in this test.

Lined up are these three new chemical trucks, each carrying 500 gallons of water and 200-foot, 1½-inch lines equipped with Elkhart fog nozzles, and 35 gallons of Unox, which gives 3,500 gallons of wetter water. Like all other equipment in the Miami Fire Department, these trucks have Motorola two-way radio. While the pump on this apparatus is rated 500 gpm, a test at a hydrant, with a static pressure of 70 pounds and a residual pressure of 35 pounds, showed that the pump delivered 1,035 gpm at a pump pressure of 150 pounds.

I remember, and not too many years ago, it was suggested that fire departments should be equipped with two-way radios. Some of the more progressive departments in the United States installed them. Some fire chiefs preached radio to their fellow chiefs, but with little success, for these old-timers again felt that the fire-alarm box, with the key and head set, was all that was necessary. But today the modern fire department has two-way radio. However, some of us still stick to the Granddad ways and will not use radio. When, eventually, every piece of apparatus is equipped with radio, those who fought it will wonder how they got along these many years without it.

Before World War II, a few departments used fog nozzles rather sparingly because they still felt that the good old straight stream was what was necessary. When we got into the war, the Navy found they were losing a lot of valuable ships by fire. Tests proved that fog nozzles were the best answer. They saved many a ship and many a crew member. But has our fire service adopted this method of fire attack today? Some have. Too many throughout the United States have not. Yet anyone who has used fog and given it the chance will readily admit that it is far superior to the straight stream. Toward this device, too, Granddads ways persist in many of our so-called modern fire departments.

Fog Nozzles and 1½-Inch Hose

Fire departments that use fog nozzles also use a large amount of 1½-inch hose and are putting out fires a lot more easily and with a tremendous reduction in water damage. Compare the handling of a 1½-inch line with the fog nozzle to the use of a 2½-inch line with a straight nozzle, with perhaps a 1⅛-inch or 1¼-inch tip.

Another piece of equipment that is of importance to the fire service is the portable light plant, with floodlights and tools. The mere use of this equipment proves its worth. Floodlights are particularly advantageous after the fire is knocked down and the overhauling is undertaken.

The exhaust fans that are used for

ejecting smoke from buildings are also of extreme importance. They help materially in the overhaul job, and to reduce probable smoke damage to many parts of a building that are not even involved in fire. Remember that a fire of any size creates a large quantity of smoke with dangerous qualities. It must be exhausted from a building as quickly as possible in order to protect your men. Here again is a problem that seems to have been neglected by many of our departments—the use of smoke masks and other similar equipment. There is no real reason why men should be subjected to dangerous smoke when masks are so easily used and are comparatively cheap—dirt cheap compared with a man's health.

There can't be a progressive fire department without competent men. This calls for a training program, first for privates and then for our officers, from lieutenants on up to the district chiefs, and for the chief who needs a lot of training in administrative matters.

Proper Administration Necessary

The fire service has to be properly administered, just like any other business. While many of us have played around with the fire game for a number of years, and no doubt think we know it all, I find that even I don't. I try out every gadget and idea that I hear of. For the last four years we have been doing a lot of experimenting with wetting agents. As a shining example of the big part they can play in rapid extinguishment, I am giving you statistics compiled for a district covered by our first chemical truck, which carried a tank with a wetting agent.

Our success with this chemical truck was so outstanding that we have put three more in service in the last eight months and, in addition, we are equipping all of our engine companies with 300-gallon water tanks and a proportioner that we developed in our fire-department shop. On the engine companies there will be two 1½-inch lines with fog nozzles, in addition to the 2½-inch hose-load with the nozzles, etc., for 2½-inch. On our chemical trucks we carry 500 gallons of water with 35 gallons of Unox wetting agent, and there are three hose lines of 200 feet of 1½-inch hose, all hooked up so that when they arrive at a fire all that is necessary is to open the valve and charge their lines. They can charge one or all lines, as demanded, and they can use either plain water or the wet water in charging any of the three lines.

The proportioner we are using does not throw the wetting agent through the pump. This is a marked advantage, because, as pointed out before, we can have one line of plain water and one line with the wetting agent, which would not be the case if the wetting agent were admitted through the pump.

For a fire college we use one of our stations with two companies, one a 750-gallon pumping engine and the other a junior aerial. On the grounds we have the conventional drill tower, six stories high, and a "fire laboratory." This building is 30 by 40 feet, two stories high, and is constructed of expanded slag—both wall blocks and beams. We have 18 thermo-couplers throughout the building and also portable couplers that can be placed at any point we desire. Cables lead from the thermo-couplers into a separate building where we get a reading of the heat at any point in the laboratory building. We have had a number of fires in this structure, and our men have found out how to handle themselves, as well as their fog nozzles and allied equipment, in order to extinguish the fire with the least amount of water and with the greatest speed.

1,500 United States Municipalities Use Recommended Milk Ordinance

ALMOST 60,000,000 Americans today are living in areas which have voluntarily adopted the milk ordinance recommended by the Public Health Service of the Federal Security Agency, Surgeon General Leonard A. Scheele of the Public Health Service recently reported in announcing publication for the first time since 1944 of the list of American cities using the ordinance.*

The ordinance is in effect in 1,468 municipalities and 367 counties and sanitary districts. It is also in effect on a state-wide basis in 11 states and the Territories of Alaska and Hawaii.

Of the total number of areas listed [Dr. Scheele said], "four states, 10 counties, and 392 municipalities require pasteurization of all market milk except that which is certified as meeting the requirements of the American Association of Medical Milk Commissions; 36 counties and 269 municipalities pasteurize all their milk voluntarily; and 13 counties and 76 cities have no pasteurized milk available because they have no pasteurization facilities.

Dr. Scheele explained that all other cities listed market both raw and pasteurized milk. The ordinance recommends but does not require pasteurization, he said.

The milk ordinance is not a set of minimum standards. It is a set of model milk regulations prepared by the Public Health Service with the aid of a national advisory board of experts in the public-health and dairy-science fields.

It is the product of experience and research, which have shown that the consumer can be protected against contaminated milk if his supply comes from disease-free cows, is properly produced and refrigerated on the farm, and then is processed and distributed according to accepted sanitary practices.

"The ordinance recommended by the Public Health Service prescribes the steps and practices for this process and is so worded that state, county, district, and municipal health departments can adopt it as law or regulations," Dr. Scheele explained.

Dr. Scheele said that the ordinance was first introduced in 1923, when it was adopted by seven communities with a total population of 277,541.

From a population standpoint [he said], the year in which the ordinance gained its widest acceptance was 1947, when new adoptions were raised by more than 11,000,000 of the total number of people whose milk supply was produced, processed, and distributed in general compliance with the recommendations of the ordinance. By the end of that year, the population coverage of areas in which the ordinance was in effect had risen from 39,663,902 to 50,834,647.

The number of areas which adopted it in 1949 added almost 5,500,000 more people to the total population of all areas in which is was in effect.

Appearance of a city on the newly issued list means that the state health department has reported adoption of the ordinance as it stands.

The Surgeon General also requested, "in the interest of national uniformity and avoidance of trade barriers," that municipalities make no changes in the ordinance when adopting it, "unless more stringent requirements are necessary to avoid conflict with state laws."

Adoption of the ordinance does not necessarily imply satisfactory enforcement, the Surgeon General pointed out:

Lack of enforcement, however, is a matter for the area concerned, and does not, therefore, bar a state, county, district, or city from appearing on the list of cities in which it is in effect.

Communities in which enforcement is excellent, as evidenced by milk-sanitation ratings of 90% or more issued by state health departments, are listed semi-annually in *Public Health Reports*, an official Public Health Service publication.*

* The list is published by the Division of Sanitation, the unit which carries out the Public Health Service's milk and food sanitation programs. Copies may be obtained free by addressing a request to Division of Sanitation, Public Health Service, Federal Security Agency, Washington 25, D. C.

Federal Civil Defense Act Receives Serious Local Study

SERIOUS doubts about the workability of some sections of the new Federal Civil Defense Act of 1950, enacted by the 81st Congress just before it adjourned early in January, continue to be voiced by representatives of both state and local governing bodies.

The Act establishes a permanent independent Civil Defense Administration with broad powers to aid cities threatened or stricken by enemy attack. It provides for a 3-year program of air-raid shelter construction, training of civil-defense troops, establishment of a warning network, and stock-piling of blood plasma and other vital materials. The Reconstruction Finance Corporation is authorized to lend municipal governments up to $250,000,000 for building self-liquidating projects, such as subways and underground parking garages, which can serve as air-raid shelters. It also provides for federal grants to help pay for projects built entirely for civil defense. The states have to match the federal contributions.

No funds were appropriated to carry out the purposes of the Act, but the new Congress is expected to do this. The Act provides that the Federal Government will contribute 50% toward construction of public bomb-shelters, and these contributions will be allocated in the ratio that the population of any single state's critical target-areas bear to the total population of such areas throughout the country.

It is expected that the total cost of public bomb-shelters would amount to $2,250,000,000 over the next three years. The value of land contributed by the state or local governments does not count in the 50% non-federal share.

Other Material Aid

In other fields of material aid, the Federal Government would share equally with the states and their subdivisions the cost of fire trucks and other organization equipment (as distinguished from personal equipment). It would bear the entire cost of regional stock-piles of medicines, blood plasma, and similar supplies, as well as the entire cost of a public air-raid warning system. The states and communities would bear the whole cost of administration of their organizations, and of the personal equipment (badges, protective clothing, etc.) for their workers.

For training purposes, the Administrator is authorized to set up a single National Civil Defense College and not more than three civil-defense technical-training schools. He would provide instructors and trainees.

The Administrator is empowered, after an emergency and under Presidential direction, to direct federal agencies to provide emergency shelter for victims, to clear wreckage, to make temporary repairs, and to provide temporary hospitals, utilities, and transportation. Reimbursement to states for disaster relief and other mutual aid extended beyond their own borders is also provided in the new Act.

One important provision establishes a Civil Defense Advisory Committee consisting of the CDA Administrator and 12 others appointed by the President, three representing the states and three representing the local governments.

Municipal Viewpoints

In commenting on the new Act for THE AMERICAN CITY, Carl H. Chatters, Executive Director of the American Municipal Association, made the following points:

We think there are some weaknesses in the bill. Of course the Civil Defense Administration was not placed in the military establishment as we recommended. The Joint Chiefs of Staff did not want it. That is enough argument for Congress regardless of any other merits.

We expect some difficulty from the fact that all dealings between the cities and the Federal Government must be carried on through the states. In theory we believe in going through channels, but, as a practical matter, some of the cities will experience a great deal of difficulty. . . . There should be some way in which the metropolitan areas or other urban areas can get help directly if the state governments do nothing. All of the federal funds are channeled through the states. If the states take no action, then the cities cannot get federal aid. If the states get information and do not disseminate it, then the cities will not have it. I think there should be some loophole to fit such cases. The Federal Civil Defense Act was hurriedly prepared and perhaps can be amended by the 82nd Congress.

Paul V. Betters, Executive Director, The United States Conference of Mayors, commented as follows in a recent issue of the Conference *Newsletter*:

As is well known, the state governments for the past year and a half have been asserting their interest and position in the over-all civil defense organization. . . . The most concrete demonstration of their sincerity will be whether or not they actually appropriate substantial amounts of state funds for civil defense to finance the 50-50 matching sections of the federal legislation. If the states do not appropriate adequate funds it will be clearly evident to all that their interest is wholly in controlling the operation and organization rather than footing any important part of *fiscal* responsibility. . . .

It is urged that all cities go to work at once in their respective states to see to it that state appropriations are forthcoming within the next few months. However, if the states generally fail to act, there is nothing left to do but to go back to the Congress and report the existing plan to be completely unworkable and unrealistic.

New York's Governor Thomas E. Dewey also criticized the Act in January. He said that New York would be entitled to $249,000,000 worth of federal aid only if the state matched this "staggering" sum and built shelters that would be used exclusively for civilian defense. He pointed out that the amount was almost as much as is spent for the entire operation of the State of New York in one year, and said that the state cannot possibly raise this kind of money.

To Lower a Water Tower

This is one way to do it. In Fresno, Calif., a 60,000-gallon tank had to be lowered and moved. So, two Lorain motor cranes, each with a 130-foot boom, held the tank aloft, while the third dismantled the legs. The tank was re-erected in Biola, Calif.

INFORMATIVE NEW VOLUME ON

Civil-Defense Measures

THE consequences of total war, should it come, are made inescapably clear in the book, "Health Services and Special Weapons Defense," a 250-page volume released late in December by the Federal Civil Defense Administration.

The volume helps to overcome a serious dearth of published material for local civil-defense organizations on biological warfare against humans, plants, and animals, and on chemical-warfare methods and hazards. The Federal Civil Defense Administration has also indicated that it will shortly release a booklet on biological warfare, written for the general public.

Although it does not say so directly, the present volume implies that if it should be necessary for American forces to explode atomic or hydrogen bombs on a potential enemy's cities, as a last resort, retaliation against the United States might well take the form of biological and chemical warfare.

Biological Warefare

The volume points out that an enemy with a reasonably modern scientific establishment can produce effective agents of biological warfare in adequate quantities, and that such pathogenic agents might be delivered by sabotage before or after open war, or as part of an open attack. Biological warfare can be directed against humans, animals, or food and industrial crops, and a wide variety of organisms and soluble toxins can be used.

The mechanisms for defense against biological warfare exist, to some extent, in our present health system, and in the existing systems already operating against accidental introduction into the country of plant and animal diseases. Both types of systems, however, will require strengthening for civil-defense purposes.

The book discusses only one general group of chemical warfare agents: the new nerve gases, which are more toxic than any previously known war gases and are nearly colorless and odorless. Civil-defense health services must create mechanisms for successful civil defense against chemical weapons, the book points out, as none exist at present. The treatment for nerve-gas poisoning, for example, is injection of atropine, a drug commonly used for eye-examination purposes.

Primary emphasis is given in the volume to the possible consequences of the explosion of a single atomic bomb in a crowded metropolitan area—possibly the worst possible type of disaster. The material on the importance of mutual-aid arrangements, and factors to consider in hospital expansion and location, is even more significant when it is recognized that a potential enemy may use several atomic bombs, if he finds it possible and worth while to explode one, in order to obliterate most of a city's public services and facilities.

Water-Supply and Sanitation Measures

The book discusses the importance of careful attention to water-supply and sanitation services in advance of disaster. A major problem would be to supply the hospitals and schools (recommended for improvised hospitals) with minimum water and sanitation service. The volume points out that "there is a real possibility that contaminated water . . . may be pumped into the distribution system to meet fire-fighting hazards." Further, multiple breaks throughout the water system might also result in contamination. Procedures are given for insuring the safety of water by isolating contaminated portions of the water system, or by chlorination. Warning is given that protection of the water system against sabotage would be essential, and it is recommended that water-utility executives be given civil-defense responsibilities for maintaining the public water supply.

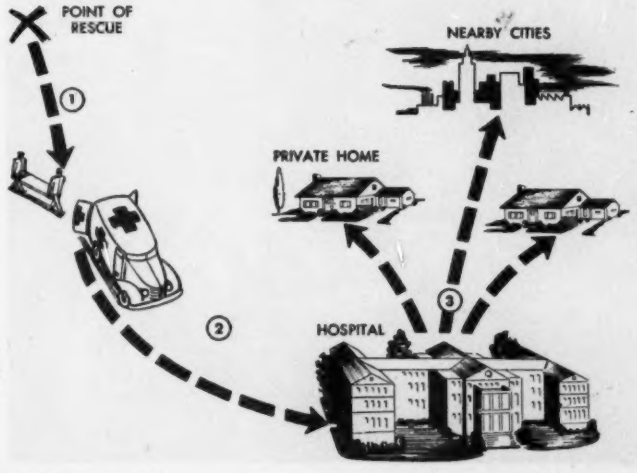
Immense responsibilities would also devolve on the civil-defense sanitation service whose duties might range from decontamination following atomic, biological, or chemical attack, to the disposition of liquid and solid wastes in case of damage to sewer systems. The sanitation services have the responsibility for the sanitation of emergency shelters, for insect and rodent control, and for conducting water, milk, and food analyses.

All in all, the book opens up a wealth of information available for practical adoption by municipal officials and local civil-defense authorities. Just how far local efforts should go in attempting to prepare for particular types of warfare is a matter for local determination. The information on which such decisions can be based is at last beginning to be available from the Federal Government. This information, if carefully considered, is not apt to encourage a "Maginot-line" type of defense preparedness, but it should lead to highly flexible and alert local civil-defense structures, in which the "intelligence" function will be of utmost importance.

Local government's stake in the effective continuing extension of attempts to resolve national differences by peaceful methods will also become increasingly apparent as civil-defense preparedness efforts reveal the vast scope of the problem of attempting to protect the populace against every conceivable type of warfare and attack.

* See book review on page 149 of this issue.

TRANSPORTATION OF NON-AMBULATORY CASUALTIES PROVIDE FOR THREE MOVES *



Floods, hurricanes, and blizzards dramatize the fact that

War Is Not the Only Peril

for which disaster preparedness is needed

A Homelite gasoline-engine-driven generator, furnishing power both for floodlights and for operating a Homelite high-cycle electric chain saw, functions in cleaning up trees blown across highways and streets.

A Caterpillar D7 bulldozer clears rubble away from a washed-out roadbed on Highway 140 between Mariposa, Calif., and Yosemite National Park. Recent heavy rains caused the Merced River to go on a rampage, flooding out roadbeds, resort areas, rail lines, and bridges. Extensive damage was done.

Whenever and wherever disaster strikes, local Red Cross chapters move into action swiftly.

All available chapter resources are utilized, and trained volunteer disaster workers toil round the clock to provide food, shelter, clothing, and other emergency necessities. After the emergency subsides, the Red Cross conducts a rehabilitation program — rebuilding homes and providing household furnishings on a basis of need.

Checking to see if all is well in the Red Cross shelter at the Keansburg (N. J.) fire house, following severe storms which drove families from their homes, is Mrs. Edward L. Irving, at right, disaster chairman of the Monmouth County Red Cross chapter. On the left is Public Health Nurse and Red Cross volunteer, Mrs. Rosine Caratenuto, who has just finished serving lunch. Even a disaster doesn't spoil the appetite of growing youngsters when lunchtime rolls around.

Buying for the City of New York

Right Now

By A. L. McMILLAN
Director of Purchase
City of New York

MISHKIN STUDIO

A. L. McMillan

ALL PROCUREMENT is tinged with fear of what the Federal Government will do. The deeper the government goes into the market, the greater the curtailment. Prices are up 20% on the average since June 1950 and range from 5% to over 100% higher.

This necessitates a review of the items in the budget. Consumer merchandise (food, fuel, medicine) for city institutions must be purchased—it cannot be deferred. But in the matter of equipment included in the expense budget (as differentiated from the capital budget) additional approval must be obtained from the Director of the Budget before purchase. Capital expenditures are reapproved individually by the Board of Estimate. While this is being done, the market is slipping away and prices are increasing still further.

A policy of non-hoarding of equipment and materials is maintained definitely except in the case of 28 city hospitals. Each separate institution is permitted to stock six weeks' supply over its normal requirements. This exception followed conferences with the civil-defense organization and the purpose is for the city hospitals to be in possession of six weeks' supplies in the event of disaster. It should be pointed out, however, that this reserve must be continually maintained and not nibbled away in daily use, as the handiness of this quantity of goods and the pressure to avoid further expenditure of funds makes this a real menace to the purpose of civil defense.

Commodities

Foreseeing the situation, the city last fall purchased a 12-month supply of certain canned vegetables, amounting to 51,500 dozen No. 10 cans and costing about $400,000. These were put in stock. By January 1951, the prices had increased 15%; and for a number of items, such as corn and tomatoes, No. 10 cans are practically unobtainable until next fall. Besides the large money saving, the city is assured of a supply for its institutions until fall.

Last July, soon after the beginning of hostilities in Korea, there were sufficient sheets and pillow slips on hand to supply the city hospitals for the current period. Additional supplies were obtained to fill out the fiscal year to June 30, 1951. In December, orders were placed for delivery during spring to meet the hospital requirements for the latter half of 1951. Since placing these orders, quotations on cotton goods have been practically withdrawn and will probably remain so until the new crop comes to market next fall.

New York City is still behind on general maintenance work, never having caught up from the deterioration occasioned during World War II. Indicative of the difficulties in purchasing today are our efforts to build up a stock of steel sheets. So keenly are they needed for repairs and upkeep of sanitation trucks, dump trucks, buildings, etc., that the sheets have been requisitioned as fast as purchased from the steel warehouses. In addition, there are back orders for a half-carload of sheets—quite a quantity, inasmuch as all purchases of steel are made from steel warehouses because of the varieties of gauges and sizes.

Since 1949 the Fire Department has wanted sheet-steel pedestals for fire-alarm boxes instead of cast iron because steel is half the weight and resists collision damage. Design and appropriation are now approved, but no material is available, owing to the priorities assigned to DO (defense orders). These pedestals are for installation in new residential districts where fire protection is now least adequate, and are therefore very seriously needed. But because this is not a military-defense item there is no priority available and they are, therefore, not procurable in the present market. The Department of Purchase has taken this matter in hand, however, by establishing, last November, a Priorities and Allocation Division, whose head gives specific and continuous attention to these problems and the relations of the city with the federal control agencies.

Water-Pipe Deliveries Have Become Extended

Deliveries of water pipe have become extraordinarily extended. With production not scheduled to begin for four or five months after placing the order, the average delivery date is given as 240 days after the date production starts. New York's annual purchases of water pipe and fittings run around 30,000 tons and are needed for new installations in areas of new plants and defense housing and other residences.

In the last week of December 1950, purchases of 24 motor trucks were made at prices averaging 23% over last purchases. One of the trucks, a 4,400-pound gross-vehicle-weight high-rack truck, cost $1,367 instead of the $1,211 paid just one month before—a rise of 12%. Another, a 26,000-pound panel truck, cost $6,225 as against $4,600 in February 1950. Every price was above the last purchase price. This group of purchases, however, virtually completed the truck-buying program for the fiscal year—1,000 cars and trucks, $3,000,000.

Not all prices are hog wild. Two 10-yard buckets for emptying garbage scows, each 17 feet wide, 13 feet high, and 13 feet long, weighing 25,000 pounds, were offered at $10,600 each as against $10,350 one year ago. An emergency purchase of 200 tons of filter alum for clarification of reservoir water cost only 7.6% more than in February 1949. That the price trend in chemicals is upward, however, is established by more recent purchases of chemicals showing 12 to 15% increases in price over pre-Korean days.

If New York City is experiencing acute shortage and increased prices, what are the small municipalities feeling?

The Business End of a Volunteer Fire Department

Lynbrook's Engine No. 2 company with its new Mack 750-gallon pumping engine in operation; the Hardie fog-foam line extending from a 350-gallon booster tank.

By ERNEST BUNTEN, *Chief Volunteer Fire Department Lynbrook, N. Y.*

THOUGH the durability of fire apparatus is legendary, it does become obsolete even if it sometimes takes a generation to do so. There are so many fire departments in the country that replacements are needed in many localities each year. They couldn't have taken place anywhere to speak of in 1941-46. Those "dry-market" years piled up needs for four or five times the norm of needed replacements.

The fire companies of the Lynbrook (N. Y.) Volunteer Fire Department were among those in the buying queue after the war. Six of our eight major pieces of equipment are new. The latest is a 750-gpm Mack pumping engine specially fitted with four discharge gates and individual gauges. Fog and foam are provided by a 350-gallon booster tank with a foam proportioner and 50 gallons of liquid foam for 2½-inch lines, as well as fog-foam nozzles, and a high-pressure booster fog gun. This unit replaced a 1930 pumper at our Vulcan Company.

The 1950 truck, minus fog-foam, is companion to a Mack 750-gpm pumping engine bought in 1946.

In 1947 our hook-and-ladder company found it necessary to replace its 1926 city-service ladder truck. The unit purchased was an 85-foot Seagrave aerial. The importance of aerials is illustrated by the fact that four villages out of the five constituting the Fourth Battalion of Nassau County now have them. Rockville Centre obtained its 85-foot aerial truck in 1941, while Malverne and East Rockaway have 75-foot and 65-foot aerial trucks.

The engine in Engine Company No. 1 is a 1927 Ahrens-Fox 1,000 gpm with a piston-type pump. This fire station also houses the Lynbrook Emergency Relief Squad, founded in 1930. It is a unit of the Fire Department, not a separate company, and seven men are assigned to it from each of the five companies. Its truck is the original Mack, carrying an E & J and two Davis resuscitators, a Molliken iron lung for use by either adult or child, a Homelite electric generator, and jacks and torches. A new Mack rescue truck at $26,600 will be delivered to us this month.

At the No. 3 Engine Company, a 1926 pumping engine was replaced by a 750-gpm Seagrave in 1947. Our floodlight unit is also located here; it is a 1937 Diamond T chassis with a special body made by the Hempstead Welding Company. A 4-cylinder Universal Engine generating unit, mounted on the rear of the truck, supplies power for one 1,000-watt and eight 500-watt Crouse-Hinds floodlights.

Hose No. 1 Company

My own company, Hose No. 1, holds a 1946 pumping engine and a 1928 hose wagon carrying 1,100 feet of 2½-inch and 600 feet of 1½-inch hose. Our company's job is to lay the hose from the aerial to the pumper and bring back another line, to give two 2½-inch lines into the 3-inch inlet of the aerial ladder truck which thus serves as a water tower.

At this point I might say that officers hold terms for two years. To become an officer the candidate must have passed the requirements of the Nassau Vocational School. The course consists of four outdoor and eight indoor sessions. The last course was attended by 40 of our 204 men.

Several other activities merit mention. Inspections that have been conducted by our Fire Prevention Bureau for ten years have resulted in reduced losses. The personnel consists of a chief inspector and five uniformed assistants.

Another efficient service is our Fire Police Squad of ten men who maintain fire lines and watch property.

10-Year Hose Replacement

For the last 20 years fabric fire hose has been used exclusively with no complaints. We keep it in service for ten years and then replace it. Alarm protection is afforded by a Gamewell automatic system and 90 boxes. Our personnel includes two paid mechanics, one on fire-alarm maintenance and the other on truck repairs. Last summer we were host to the South Shore Volunteer Firemen's Association. The 60-department parade took three hours.

Durham, N. C., Plans Aerial Survey

BECAUSE they can obtain accurate information at "a material saving in time and expense," city department heads have recommended, and the City of Durham has approved of, the use of aerial surveys for over-all mapping work.

First maps will be delivered to Durham this spring. The maps will cover an area of 31 square miles; they will be prepared at a contour interval of 5 feet, and to a horizontal scale of 1 inch to 200 feet. Primary use of the new maps will be in city planning and engineering for water, street, and sewer improvements.

Aero Service Corporation of Philadelphia, will perform the work. The firm is also mapping Cleveland, Ohio, as well as a number of state highways. In addition to the contour maps, the firm will deliver aerial photos of a larger area, covering 35 square miles for planning purposes.

Utility Buildings Need Not Be Eyesores

THE seven Connecticut telephone buildings shown on this page testify to the public spirit and good taste of their builder, The Southern New England Telephone Company, whose headquarters are at 227 Church St., New Haven.

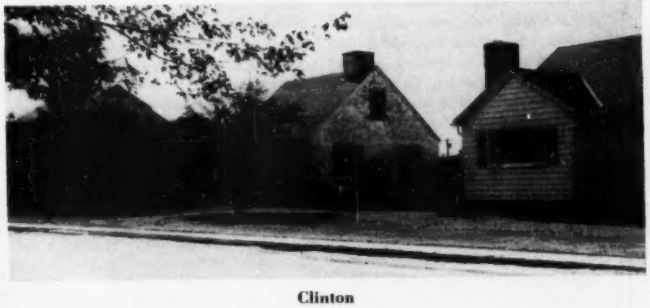
When planning to build on property zoned for residence, instead of asking that the site be rezoned for business, the telephone company appeals to the zoning board for an exception (if such is necessary) to permit the erection of a building properly set back and harmonizing with the architecture predominating in the local community.

(In the top three photographs at the right, the telephone building is shown in the center.)

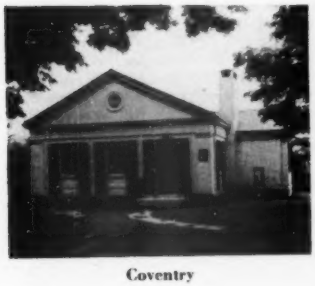
Windsor

Saybrook

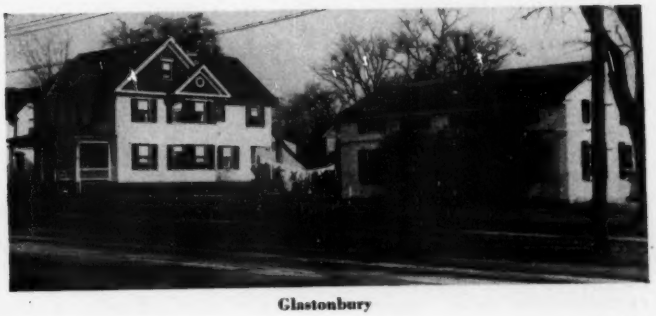
Fairfield



Clinton



Coventry



Glastonbury

Wethersfield

PHOTO COURTESY NEW YORK CITY PARK DEPARTMENT

A recent view of the new Wollman Memorial Rink.

New York City Opens Large Memorial Skating Rink

By DR. ROLAND C. GEIST
Secretary
College Skating Club
New York, N. Y.

THE largest frozen artificial ice rink in the world, consisting of 28,000 square feet of ice surface, or three-fourths of an acre, was opened in New York City on December 21. In addition to being large in size, the ice rink represents one of the largest private donations to be given to the city, and its building and management combine private-municipal cooperation which should be applicable in any municipality.

The Wollman Memorial Rink is a gift from Miss Kate Wollman, who donated $600,000 for its construction. The City of New York appropriated an additional $200,000 for landscaping and playground areas. The Memorial is located near 63rd Street on the east side of Central Park, near the center of the city and close to the 59th Street subway stations.

The rink was planned by Embury and Lucas, architects, and constructed in a natural amphitheater, reclaimed from a swampy waste area. The rink is in the shape of a horseshoe, with semi-circular buildings at the north end housing rest rooms, restaurant, dressing rooms, refrigeration, and ice-cleaning machinery. The rink is well lighted for night skating. It is six times as large as the famous Rockefeller Plaza skating pond. Sixteen miles of 1¼-inch wrought-iron pipe were used in its construction, and more than a thousand skaters can use it during a session, with room to spare.

The Park Department will operate the rink for ice skating in winter, with roller skating, dancing, and concerts in the summer. The admission rates will be moderate—less than half the rates charged by private skating rinks in the city. Admission will be free to children on Saturday mornings. Afternoon sessions for school and college people will cost from 9 to 25 cents for two hours, from 3:30 to 5:30 p.m. Evening sessions, reserved for adults, will cost 50 cents, and operate from 8:30 to 11 p.m. There will be special in-between-time public sessions for patch figure skating, ice dancing, free-style routines, and a speed workout session at nominal rates.

It is expected that Wollman Skating Clubs will be organized in some of the New York City high schools located near the rink. Students may join the school club without cost, and the only expenses will be a weekly 9-cent admission fee to the rink. Group instruction at very low fees will be given by the senior rink instructor, Dr. Paul von Gassner. At the end of the season, the high-school clubs will present an ice carnival at the rink, with free admission to the public.

This is the New York City Park Department's second venture in conducting municipal skating recreation. In 1939, the New York Building at the World's Fair was reconstructed into an indoor ice-and-roller-skating rink. It was well attended, and functioned at the low public-admission rates of 22 cents and 44 cents. After five years of operation, the building was taken over by the United Nations, which still uses the building. It is expected that, as the United Nations moves to its new location in Manhattan, the building will be returned to the Borough of Queens for use once again as an ice rink.

Decreasing Reliance on Property Tax Predicted

IN the opinion of George W. Mitchell, Director of Finance of the State of Illinois, property taxes will almost certainly decline in the future, relative to income, sales, and business taxes, and are likely to decline relative to the value of property.

Speaking on the subject of "Property Taxation in Relation to Investment in Urban Areas," on December 28, 1950, at a joint session in Chicago of the American Economic Association and the American Finance Association, Mr. Mitchell predicted, in summary, that—

> Among the factors affecting investment in urban areas the level of property taxation seems at best of second-rate importance. A host of factors surrounding the federal individual and corporate income tax seems much more important. . . .
>
> The opportunities for investment in urban real estate depend to a significant degree upon the precise location of the real estate—whether it is located in a community having a wealthy tax base and limited demands upon it for government services, or whether it lies in a community that has heavy governmental obligations and a modest aggregation of property tax to support them. It also depends upon the type of property, since typical assessment practices make for material differences in effective tax rates at between owner-occupied residential property and tenant-occupied residential property.
>
> Finally, the future of the property tax is inextricably bound up with the future role of local government. These governments have been shrinking in relative importance, their major responsibilities in terms of cost are being financed to an increasing extent by state and federal grants. Some of the larger governmental units have found that they, too, can use sales and income taxes as well as charge for selected types of local service. All these developments tend to reduce future reliance on the property tax. As of today and in the foreseeable future, it does not appear to be a significant deterrent to urban investment.

Regional Development Council Urges New Towns for D. C. Region

INCREASING official consideration is being given to both the problems and opportunities involved in making a start at decentralizing the government services of the National Capital, as essential for security in the event of future atomic attack. In December the U. S. Senate Subcommittee on Public Buildings of the Committee on Public Works held hearings on the federal bill to spend about $140,000,000 in constructing four groups of federal office buildings dispersed in the region surrounding the District of Columbia, including connecting highways and other public works.

Members of the Regional Development Council of America, an organization which has been studying problems of decentralization for 30 years, were among those who testified on this proposal. The Council urged that no decentralization of office buildings should be attempted without providing both housing and full community facilities, including markets and schools, for the major part of the personnel employed in the new offices. It pointed out that the proposal to have the working staff commute from Washington will impose extra demands on transportation at a time when gas and tires will be in short supply, and when the roads should be kept free for other services. "What is worse," the Council's statement declared, "the bombing of Washington by night, with the staff allowed to remain there, under the present plan, might wipe out the office workers themselves, leaving only the buildings to carry on."

Clarence S. Stein, well-known architect and town planner, made the following points in his testimony before the subcommittee as R.D.C.A. president:

> To break up the present pattern of continuous sprawling growth, which is both costly in terms of the economic burdens of congestion and insecure against aerial attack, the Federal Government must assume the responsibility for leadership in planning and decentralized organization. The pattern you work out here in Washington can in large degree be applied to other centers, from which vulnerable industries or administrative services must be removed, if the present crisis continues or turns into active war. If we permit the present hit-or-miss methods of suburban development to continue in this field, without intelligent direction by the government, far too much housing will be located in the wrong place, or on land too close to the central targets to provide real security. Furthermore, no individual developer can ensure the maintenance of open land about a new community—though such open space is the best possible safeguard against a damaging attack. . . .
>
> During the past two World Wars, the Federal Government at first minimized the need of adequate homes and communities for workers. In both cases, the resulting high turnover of workers, their inefficiency and dissatisfaction, led to positive action—but too late to secure 100% work and efficiency when most needed—that is, at the beginning.

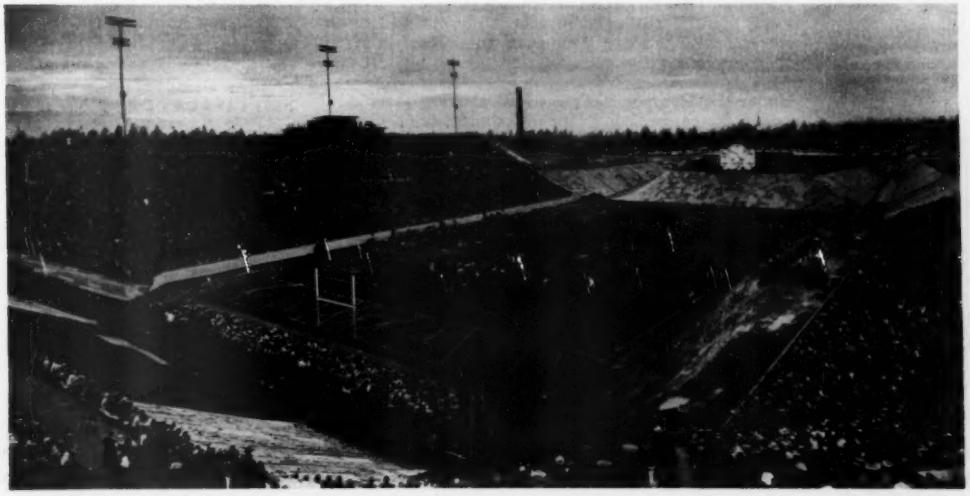
Mr. Stein urged that the government acquire enough adjacent land to the proposed office buildings to permit complete communities to be built. He said that local government agencies should be assisted by the Federal Government in supplying educational and other municipal facilities in the new towns, until such a time as they are self-supporting.

Spokane's New Memorial Stadium

A MEMORIAL to the men of the armed forces of World War II and a gift to the city and citizens of Spokane from private clubs and associations, this fine stadium was dedicated recently by Governor Arthur B. Langlie and Mayor Arthur Meehan, of Spokane.

Known as the Spokane Memorial Stadium, the structure has been built in a beautiful spot near the bank of the Spokane River, on pine-covered slopes —a setting which will increase its value for music and dance festivals as well as athletic events. Acres of open land around the stadium have been leveled for ample parking accommodations and for easy access to the grandstands.

The Athletic Roundtable, the Spokane Press Club, the American Legion, the Elks, and many other organizations contributed to making this recreational asset possible. Upon its completion the stadium was given to the city, which will operate and maintain it.



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Items of Emergency News

Clear Thinking on Atomic-Bombing Effects

DAMAGING though the effects of an atomic-bomb explosion on an American city would be, careful analysis indicates that much can be done to minimize the destruction of lives and property. Moreover, radiation effects will only be minor, compared to the effects usually associated with a terrific explosion.

Edward J. Kehoe, Chief, Fire and Accident Branch, New York Operations Office, U. S. Atomic Energy Commission, made these points in a speech at a recent meeting of the American Society for Testing Materials in New York.

Mr. Kehoe declared that in the atomic attacks on Hiroshima and Nagasaki only 5 to 15% of the deaths were directly attributable to radiation; the vast majority of deaths were caused by concussion, falling walls, shattered glass, burns, and other causes. All of those killed by radiation received their lethal dose within seconds after the bombs were detonated, and in both cities *there were no cases of damage to human beings from residual activity.* Mr. Kehoe pointed out that the fire raids on Hamburg killed more people than the atomic bomb-burst at Nagasaki, and that the damage done at Hamburg was equal to that from two atomic bombs.

It can be seen from a review of the facts that the air-burst is the most devastating type of bomb-burst on a city from the viewpoint of physical damage [Mr. Kehoe said]. In such an attack, the fire-fighting problem would be extremely severe, but its major factors are those which would have to be coped with in a conflagration following any tremendous explosion; the hazard to those who survive the initial blast will be relatively minor. . . .

In a group of firemen who might be called upon to combat the conflagration resulting from an atomic bomb-burst, a small portion might possibly receive ill effects, probably of a temporary nature, from radiation; however, this will actually be much less of a risk than the other risks which a fire fighter takes at such times—risks such as danger from falling walls, bursting hose lines, flying glass, and traffic accidents. . . .

Consideration should be given to transferring some units of municipal fire apparatus, after careful study, from the high-value districts of a city to the outskirts. The manpower on duty in the high-value district could remain, thus enabling the fire chief to make full use of the capacity of the remaining apparatus in fighting peacetime fires. In most large cities, the shortage of manpower is generally the problem facing the fire chief rather than an insufficiency of pumping capacity. Off-duty personnel will generally be in residential districts, and in the event of atomic-bomb attacks could report to the outlying fire stations to man the reserve apparatus. We must anticipate that fire-fighting units in the middle of the target area will suffer severe casualties, but these may be reduced by even so simple a procedure as going to the cellar when an atomic-bomb attack impends.

Even for peacetime service, our use of radio communications should logically be expanded to the point where communication to each unit is completely independent of local power and land-wire service. This indicates the fullest utilization of radio-equipped apparatus and possibly a completely self-contained, mobile transmitting headquarters normally stored in the outskirts of the city.

See also "Fire Effects of Bombing Attacks," published by National Security Resources Board in November 1950. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 45 pp. 15 cents. Other civil-defense manuals are to be published soon on techniques for dealing with fire warfare.

Basic Air-Raid-Warning Code Announced

A BASIC code of public air-raid-warning signals to be used by all states and cities in the event of enemy attack has been announced by Willard Caldwell, Federal Civil Defense Administrator.

Effective now, the two-stage, public-warning code will be used to announce imminent attack and the subsequent "All Clear." The "Red Alert" public-warning signal will be of three minutes' duration. It will consist of fluctuating or warbling signals of varying pitch by sirens, or a series of short blasts by horns or whistles.

The "All Clear" signal will be a series of three steady one-minute blasts by sirens, horns, or whistles, interrupted by silent periods of two minutes each.

In sounding these signals, municipalities are free to use any type of siren, horn, or whistle in conformity with the code. Sound trucks and public-address systems may be used to supplement these warning instruments if desired. Regular radio and television broadcasts should not be used to broadcast the public-warning signals at this time. The role of the broadcasting industry in civil defense is currently under study by a committee including representatives of the Federal Communications Commission, the Department of Defense, the Civil Defense Administration, the National Association of Broadcasters, and major networks.

The "Red Alert" public warning will be sounded by municipalities when the key-point warning stations, operated by the Continental Air Command, U. S. Air Force, have received the signal that enemy air attack is imminent.

In announcing the basic public-warning system, Administrator Caldwell urged that state and city civil-defense authorities immediately undertake a series of full-scale, widely publicized public tests of the warning system, in order that the general public may be thoroughly familiar with what to do in case of actual enemy air attack.

Consultants Appointed To Advise on Dispersal

FOUR consultants have been appointed to advise on problems connected with the proposed dispersal of essential functions of the Government from Washington, Jess Larson, Administrator of the General Services Administration, has announced. They are: Louis Justement, architect, of Washington, D. C.; Dr. Abel Wolman, Professor of Sanitary Engineering, Johns Hopkins University; Clarence S. Stein, architect and city planner, of New York City; and Frederick P. Clark, Planning Director of the New York Regional Plan Association.

Mr. Larson has stated that the consultants will be called together at intervals to advise the staff of the General Services Administration and cooperating agencies on problems encountered in the development of dispersal plans, particularly on the relationship of the proposed offices to the development of the surrounding metropolitan area.

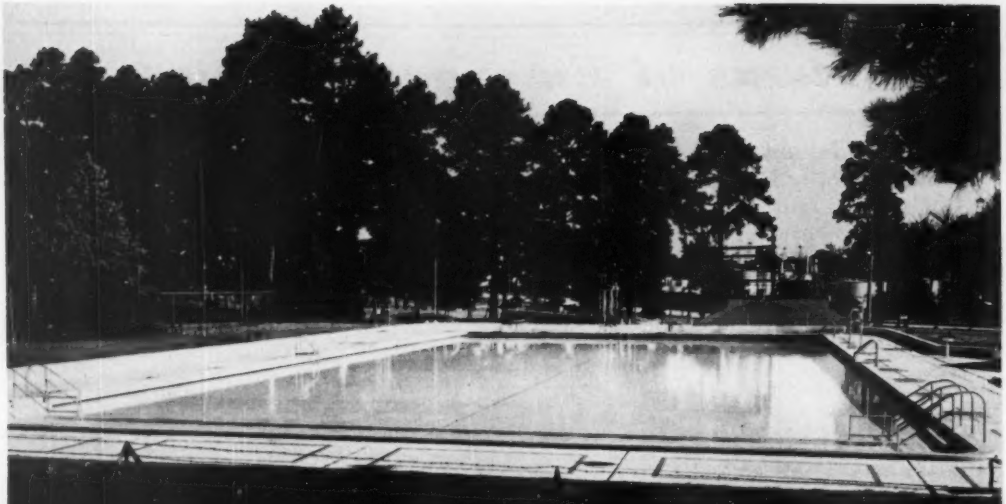
The General Services Administration will work closely with the National Capital Park and Planning Commission, the planning and governmental agencies of affected localities, and the States of Maryland and Virginia to bring about proper integration of the dispersed employment centers with the sound development of the expanding suburban area.

"Dispersal is not just an emergency plan," Mr. Larson said. "It is a plan for the permanent relocation of essential government facilities both in the interest of security and of the long-range efficiency and economy of government operations at the Nation's Capital."

Recipe for Unpreparedness

Take one cup of official ineptness; add two measures of citizen disinterest; stir in plenty of gaseous proclamations; season to taste with pros and cons from all parties; and let all fervor cool. When aged well, beat anew with plenty of clamor until it becomes an old story. Set aside for cooking over the first atom bomb that may come the city's way.

From *Public Works Planning Newsletter* of the Tennessee State Planning Commission.



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Zoning and Planning Notes

Edited by NORMAN WILLIAMS, JR.

Zoning Protection for High-Class Residential Areas

NEW YORK. *Gignoux* v. *Village of Kings Point*, 99 New York Supplement (2d) 280 (Supreme Court, June 22, 1950).

NEW JERSEY. *Lionshead Lake, Inc.* v. *Wayne Township*, 73 Atlantic (2d) 287 (Superior Court, May 12, 1950), reversed, 74 Atlantic (2d) 609 (Appellate Division, July 20, 1950).

THE problem of protecting expensive high-class residential areas by zoning regulations has arisen in two series of recent cases, one involving requirements for acreage plots and the other involving prohibitions of small homes.

The phenomenal shift in Nassau County, Long Island, from a predominantly farming community to predominantly a middle-class residential area has been having its impact even upon the relatively small sections already devoted to expensive residences and estates. As a result, the zoning regulations in such sections requiring one or two acres for all residential development have been challenged in court in at least three cases. In the *North Hills* * case, a lower court decision invalidating such a provision was reversed in the Appellate Division. Two other decisions involved small residential villages located at the tip of a point of land extending into Long Island Sound. In the Kings Point case, the Supreme (lower) Court upheld the regulation; another case involving Lloyd Harbor has been snarled in procedural complications.

Kings Point, a village with a population of about 2,000 located at the end of the Great Neck Peninsula, is solidly residential, with no stores or even schools or churches. Most of the residential development is expensive and attractive, and almost the whole village is zoned for one-family residences with a requirement of 40,000 square feet. The Court found that there was a substantial demand for such residences.

One-Acre Provision Upheld on Two Grounds

In the decision the one-acre provision was upheld essentially on two grounds. First, such restrictions could reasonably be adopted in order to protect a semi-rural atmosphere for those who wanted it—with plenty of light, air, and sunshine, with peace and quiet undisturbed by traffic, and retaining beautiful natural surroundings. Second, zoning regulations could be adopted to protect an existing district, and particularly an exclusive high-class rural area. The language is worth quoting:

> We are here dealing with a most unusual village. With no industry or business and not even schools or churches, it is apparent that the officials of this village, from its incorporation, strove to make it available for residential purposes only, for those who desired the advantages of a community distinctly rural in character and for those who might desire the advantages of the quiet and beauty of rural surroundings.
>
> Nassau County, once rural, is fast losing that distinctive characteristic owing to the great influx of population and the unprecedented construction of new homes. It is wholly understandable that there would be people who would desire the establishment of a community of homes in which traffic congestion should be at a minimum, adequate light, air, and sunshine should be afforded, the danger from fire should be at a minimum, peace and quiet would be enhanced, where life would be a relief from the densely populated areas adjacent to a great city and where the general enjoyment of life incident to such an environment would be promoted by zoning regulations tending to preserve and increase the beauty of the village in its distinctive setting and natural characteristics. . . .
>
> The Village Law, Section 175, empowers a village to regulate, among other things, the density of population. The requirements of minimum lot area per family is a well-recognized method of controlling population density. . . .
>
> The beauty of a residential neighborhood tends to the comfort and happiness of the people of a community. It tends to promote the general welfare, adds to the attractiveness of the community and living conditions therein and to the value of residential property therein located. . . .
>
> Real property located in a village does not have to conform in zoning restrictions with other villages. If the inhabitants of a village desire to make the real property therein available for residential purposes only, so that its beauty and rustic character may be preserved and increased and such zoning may be accomplished without arbitrary and confiscatory action, such a village should be sustained in its attempt to secure the village from noise and traffic, the danger from fire, a better opportunity for rest and relaxation and safety for children.
>
> The Court is not convinced that the action of the zoning authorities was arbitrary or unreasonable. In fact, it finds just the opposite. The Court is convinced that the zoning had a definite bearing upon the general welfare. . . .
>
> We are dealing here with a village surrounded by water on three sides, wooded in part and considerably developed with a high type of residential construction. There was an attempt by the zoning authorities not only to preserve the exclusive, high-class, and rural aspects of the community but also to insure the further development of the land within the village along the lines of the present development.
>
> The Court did, however, insert a caveat as to the possible misuse of such regulations.
>
> Of course, a zoning ordinance may not be used for the purpose of setting up barriers against the influx of persons who are able and willing to erect homes upon lots which are reasonably restricted. The question before the Court is whether the zoning regulations here attacked are reasonable in their character and operation.

Special Problems—Difficult Decisions

Special problems arose with respect to some lots with low swampy land, and others located across a street from much less elaborate homes in the next village. As for the swamp land, the Court pointed out that it was no more desirable for smaller than for larger residences, and in fact was best used when included in larger lots. As for the lots along the boundary, the Court made the obvious point that "a district has to end somewhere," and suggested that development in these lots could be screened from the road and the houses across the road—a suggestion advanced at the trial by Hugh R. Pomeroy, one of the most experienced and persuasive of American planners, who appeared as an expert witness for the village.

Acreage Zoning

The problems of acreage zoning involved in the pending cases require difficult decisions. The maintenance of some fairly open and peaceful areas near our great cities is obviously desirable; those who desire that kind of environment should not have to travel 50 miles to and from work every day. While it is at least debatable whether acreage zoning regulations can really be defended on the basis of providing light and air, there is a solid basis for such regulations in other legitimate goals of zoning—plenty of open space, freedom from traffic, noise, and bustle, and the preservation of beautiful natural surroundings. Of these arguments, the esthetic is perhaps the most honest one. However, the problem in suburban areas arises from different considerations, which are often all too evident. The appropriate areas are often expensive and stylish, and much of the support in such areas for acreage regulations derives from a desire to protect the exclusive high-class character of the area, i.e., to keep out people who are undesirable because less wealthy. The courts have generally—and rightly—held that in a democratic society it is improper to protect one group of citizens from having another group of citizens as neighbors.

In a direct situation, in open and slightly settled rural areas, acreage zoning regulations might be supported by two arguments which are not relevant in the above case. First, in such areas acreage requirements might be adopted in order to prevent small scattered subdivisions, located miles apart and all demanding expensive municipal services, such as sewers, schools or school buses, etc. Second, where there are no sewer connections, the need for dispersion from septic tanks may dictate a requirement for a large lot, with the size varying according to sub-soil conditions.

As for the New Jersey minimum-building-size case, Wayne Township, located on the outskirts of Paterson, contains a population of about 9,000 scattered over 25 square miles—including a considerable number of summer homes, mostly along several lakes. The local zoning ordinance set a minimum size for permitted residential buildings in all districts as follows:

(*Continued on page* 155)

* Discussed on page 147 of the October 1950 issue of THE AMERICAN CITY.

Traffic Analysis

In order to establish regulations which will control the flow of traffic at street intersections, highways, bridges, tunnels, terminals and airports, traffic officials must carefully analyze the volume, type, directional flow and peaks of traffic.

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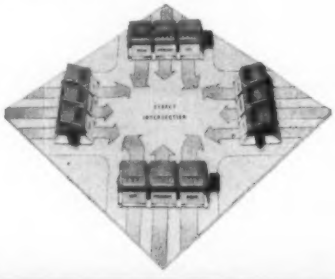

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Legal Notes and Decisions

Prepared by NATIONAL INSTITUTE OF MUNICIPAL LAW OFFICERS
Charles S. Rhyne, General Counsel

Beer—Ordinances Prohibiting Sale and Possession

In action to enjoin enforcement of two ordinances of Town of Lexington prohibiting sale and possession of beer within town, held that word "possession" would be elided from ordinances and provisions prohibiting sale and storage as authorized by charter and general laws would be sustained. *Helms* v. *Richardson*, 231 S. W. (2d) 1019 (Tenn., July 15, 1950).

City Employees—Resolution of School Board Requiring Loyalty Oath by Teachers—Validity

In action brought against Board of Education to enjoin Board from enforcing and carrying out resolution requiring employees of Board of Education in city school district to execute oath to the effect that he or she is not a communist and is not a member of any organization advocating any seditious practice or overthrow of United States government, held that resolution of Board requesting employees to file such oaths and affidavits was not violative of the Constitution of the United States and did not amount to a bill of attainder, judicial notice being taken of the fact that whoever is communist is member of organization whose international purpose is to destroy government of United States. *Dworken* v. *Cleveland Board of Education*, 94 N. E. (2d) 32 (Ohio Ct. of Com. Pleas, Cuyahoga Co., June 13, 1950).

Disabled Veterans—Police Pensions—Credit for Time in Military Service

Where policeman obtained leave to enter military service and was honorably retired therefrom, held that he was entitled to credit for time spent in service as time in police department, though he was never reinstated into active service in department because of his disability. *Quam* v. *City of Fargo*, 42 N. W. (2d) 292 (N. D., June 29, 1950).

Garbage Collection—Fees—Ordinance Providing for Imprisonment for Non-Payment

In habeas corpus proceedings to obtain release from imprisonment for default in payment of penalty imposed for violation of ordinance of City of Hugo providing for garbage-collection fees, held that the ordinance was valid exercise of police power and that imprisonment for violation of the ordinance did not constitute "imprisonment for debt" in violation of state constitution. *Ex parte Small*, 221 Pac. (2d) 669 (Okla., July 26, 1950).

Hospitals—Maintenance of a Governmental Function

In action to recover damages for injuries sustained by fall down elevator shaft at city-operated hospital, held city immune from suit because maintenance of hospital is a governmental function. *Martinson* v. *City of Alpena*, 41 N. W. (2d) 148 (Mich., Oct. 2, 1950).

Licenses—Amusement Parks—Denial for Prior Gambling Violation

Where licensing ordinanse forbids issuance of license to amusement park unless all state laws and ordinances were complied with, held gambling violations occurring in 1948 were sufficient for refusal of license to operate amusement park in 1949, notwithstanding that violations were during and under license issued for previous year and that license had been revoked on same ground. *Eastwood Park Amusement Company* v. *City of East Detroit*, 43 N. W. (2d) 851 (Mich., Sept. 11, 1950).

License Tax—Hauling Loads Combining Intrastate and Interstate Property Not Subject to Tax

In action by city against carter company for engaging in business of a carter in city without first having obtained and paid for license in violation of city code, held that carter was engaged in interstate commerce and was not subject to ordinance imposing license tax for each cart operated to transport property and merchandise within city where every load of carter combined intrastate and interstate property and cart could not separate loads and could not discontinue any part of service. *City of Chicago* v. *Willett Company*, 94 N. E. (2d) 195 (Ill., May 18, 1950).

Occupation Taxes—Computation of Tax by Number of Employees

Where ordinance imposed occupational tax upon business, professions, and occupations, under which tax was computed on number of employees in each business and profession and under which payment was asked for $20 for first owner, partner, manager, or employee, plus $6 for each additional owner, partner, manager, or employee up to nine, held that such ordinance was not violative of the due process of law clauses of the state or federal constitution. *Jackson* v. *City of Glenwood Springs*, 221 Pac. (2d) 1083 (Colo., Aug. 28, 1950).

Ordinance—Requiring Used-Car Dealer to Be New-Car Dealer Invalid

In action to have ordinance regulating business of selling used or new automobiles in Town of Kearney declared unconstitutional, held that provision or ordinance requiring dealer of used automobiles to also be authorized dealer in new automobiles was invalid. *Signore* v. *Rizzolo*, 75 A. (2d) 757 (N. J., Sept. 26, 1950).

Parking—Prohibition During Certain Hours—Commercial Vehicles

Where ordinance of Oklahoma City provided that no commercial vehicle should be parked on highway in city outside of business loop between hours of 8 p.m. and 4 a.m. except for necessary time to load and unload, held that such ordinance was designed to protect traveling public against hazards of travel and was not violation of equal protection clause and constituted valid exercise of police power of city. *Corbett-Barbour Drilling Co.* v. *Hanna*, 222 Pac. (2d) 376 (Okla., July 18, 1950).

Referendum—Selection of Site for City Auditorium After Voter's Approval of Bond Issue

Where bond issue for construction of city auditorium had been voted by electorate by way of amendment in home-rule charter, and city council had been directed to select site, held that selection of site of auditorium was no longer subject of referendum and proposed referendum election would be enjoined. *Noble* v. *City of Lincoln*, 43 N. W. (2d) 578 (Nebr., July 13, 1950).

Segregation—In Swimming Pools Unconstitutional

In action questioning city's action in refusing to permit Negroes to use swimming pools operated by public funds, held such refusal deprived plaintiffs and others of equal protection of laws guaranteed under the Fourteenth Amendment to the United States Constitution. *Draper* v. *City of St. Louis*, 92 Fed. Supp. 546 (U. S. D. C., E. D. Mo., July 17, 1950).

Signs—Ordinance Requiring Removal of Valid

In action to restrain enforcement of ordinance prohibiting maintenance of overhanging signs on streets, held control of streets and sidewalks by city includes space above surface and ordinance valid. *Oscar P. Gustafson Co.* v. *City of Minneapolis*, 42 N. W. (2d) 809 (Minn., May 26, 1950).

Slaughter House—Ordinance Invalid As Prohibiting Operation of Within Corporate Limits

In action to enjoin defendant municipal corporation from enforcing an ordinance which would make it unlawful for any person to erect, maintain, or operate a slaughter house within the corporate limits of the municipality, held a slaughter house is not a public nuisance *per se*, the municipality acquired no right to prohibit the erection of slaughter houses under its charter power to "prevent and remove nuisances," and the ordinance is invalid. *Mayor and Council of Mount Airy* v. *Sappington et ux.*, 73A. (2d) 449 (Md., May 10, 1950).

Streets—Crossing at Place Other Than Crosswalks—City Not Liable for Damages Resulting Therefrom

In an action to recover for injuries alleged to have been sustained by pedestrian who proceeded to cross street at place other than the crosswalk and slipped on street and fell into a drain, held the city had no duty to anticipate that pedestrian would leave sidewalk to cross street at place other than crosswalk and city was not held to same degree of care in maintaining its streets in a safe condition for pedestrians as it was as to sidewalks, so that petition did not state a cause of action. *Smith* v. *City of Emporia*, 219 P. (2d) 451 (Kan., June 19, 1950).

Taxicabs—Ordinance Restricting Operation of to Owner, Agent or Employee

Where City of Charlotte adopted ordinance restricting operation of taxicabs to owners, agents, and employees of owner to whom owner pays fixed and definite wage, and prohibiting owners from contracting with drivers where driver pays owner fixed sum per day for use of taxicab, held such ordinance constitutional and valid. *Victory Cab Co.* v. *Shaw*, 59 S. E. (2d) 573 (N. C., May 24, 1950).

Taxicabs—Police Department Rules and Regulations—Absence of Standards

Where city ordinance granted to police department authority to promulgate rules and regulations as it deemed necessary for the conduct of taxicab business and specifically provided that police department might promulgate rules and regulations as to cruising, using of streets, and equipment, held that rules and regulations adopted by police department were not invalid by reason of failure of city to formulate standard in delegating power to promulgate such rules and regulations. *Hoff* v. *City of Long Beach*, 99 N. Y. S. (2d) 397 (N. Y. Sup. Ct., Queens Co., Aug. 21, 1950).

Water System—Pipe Serving Fire Hydrant—City Liable for Damages Caused by Leak

In action against city for damages to property caused by escaping water from water main, held that city operated water system as proprietary function and was liable even though lateral pipe causing damage served fire hydrant. *Cole Drug. Co. of Massachusetts* v. *City of Boston*, 93 N. E. (2d) 556 (Mass., July 3, 1950).

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Recent City Manager Appointments

A. L. BARNETT has been appointed to fill the city-manager position at Durango, Colo., vacated by GEORGE R. HUBBARD.

LEROY B. BARTLETT has succeeded FRED CHEATHAM as manager of Springfield, Ore.

Effective January 1, R. POWELL BLACK, formerly apprentice city manager at Alexandria, Va., became the first city manager of Jasper, Ala.

J. D. CHEEK has been appointed manager of Ada, Okla., to succeed J. W. FLINT.

LARRY M. CROW, assistant manager of Wichita Falls, Texas, will be manager of Harlingen, Texas, where F. R. LUCAS has been acting manager.

JAMES P. DUNN was appointed city manager of Fargo, N. D., to take office on February 15. The former manager, LEROY F. HARLOW, has just become the first manager of Richfield, Minn.

SIDNEY S. FRISSEL has returned to the city-manager field as manager of Hastings-on-Hudson, N. Y. Formerly manager of Littleton, N. H., he has been in private business for some months.

On February 1, WALTER HAHN, JR., planning consultant, succeeded CLYDE DORSEY as manager of Monterey, Calif.

HARLEY JOHNSON has been appointed manager of Hart, Mich. He succeeds GEORGE NICOL.

Lakeland, Fla., has appointed E. E. KELLEY, JR., of New York City, formerly of Lakeland, as its new city manager. DAVID O. PAYNE will continue as acting manager until Mr. Kelley takes office on April 1.

W. M. KENNEDY, who has been acting manager of Rock Hill, S. C., since FRANK JACOCKS left, was appointed the city manager on December 21, 1950.

WILLIAM I. LANE, mining engineer, was named city manager of Belleville, Kans., succeeding NEAL HARR.

GEORGE O. MATKIN, design engineer, is now manager of Nephi, Utah.

When DAVID M. YOUNG'S resignation as manager of Iron River, Mich., becomes effective on April 1, 1951, he will be succeeded by JULIUS S. METROS.

J. B. MORLEY, JR., formerly at Gainesville, Fla., has succeeded JAMES M. TITUS as manager of Daytona Beach, Fla.

JAMES NEVILLE, formerly city engineer at Scottsbluff, Nebr., assumed his duties as manager of Nevada, Mo., on January 15.

On January 8, RAYMOND F. O'HARA, planning engineer, assumed his duties as city manager for Delano, Calif. He succeeds B. P. WESTKAMPER.

At Elmira, N. Y., ROBERT E. QUIN became the new city manager on January 1. MAX F. DENNIS has been the acting manager.

HAROLD K. SCHONE is the new manager at Oak Park, Mich., succeeding STEPHEN DERRY.

The city manager of Malartic, P. Q., is now P. A. E. VILLANEUVE, formerly a consulting engineer, succeeding L. C. SAVARD.

Have You Codified Your Ordinances?

NOT every city attorney or city solicitor is fortunate enough to have inherited an up-to-date codification of the ordinances of his particular city. He, therefore, must often pass through some trying situations in an effort to determine the correct answers to many questions concerning the existing legislation. In all probability he is confronted with conflicts between the ordinances themselves, or between the ordinances and the charter provisions, or between the ordinances and the corresponding state laws regulating the same subject. He often discovers "overlapping" among the provisions of his ordinances. Yet, without councilmanic authority, he is powerless to correct these many discrepancies.

Municipal officials are becoming conscious of the need to put in the hands of the city officials and the citizens a modern city code, containing an orderly arrangement and codification of the ordinances of general and permanent nature. There appears to be a strong tendency to enact needed legislation, to take steps that will make for the permanent preservation of these laws, as well as to keep them abreast of the ever-changing state laws on the same subject, and in line with the changes brought about by judicial decision. Officials don't like the possibility that they are operating with ordinances which may be out of date, ambiguous, or conflicting to the point that they may be thrown out of court when enforced.

How a city's laws can be modernized is explained by citing the methods of one of the organizations set up exclusively to codify, classify, edit, and index municipal ordinances. Michie City Publications Company, Inc., with its home office in Charlottesville, Va., maintains a permanent editorial staff of law writers. These people are trained in the writing of ordinances, their use, and the elimination therefrom of conflicts and inconsistencies. After the company completes the basic editorial work, the supervising editor carries the manuscript to the city and reviews it with the city attorney for any needed changes.

Representative Municipal Bond Sales
January 9-17, 1951

Municipality	*Amount*	*Purpose*	*Average Maturity (Years)*	*Net Interest Cost (Per cent)*
Bay City, Mich.	$2,000,000	Water revenue *	17-5/6	1.60401
Carthage, N. C.	105,000	Water	16-3/4	2.248
Clayton School Dist., Mo.	800,000	High school building	8	1.222
Columbus, Ohio	250,000	Motor vehicle and equipment	3-2/3	1.186
Dallas, Texas	4,000,000	Water, street, sewer, airport, park, garage	10	1.412
Davidson Co., N. C.	1,000,000	School building	15	1.68339
Evansville, Ind.	5,500,000	Sewer revenue *	23-1/3	1.729
Glen Cove, N. Y.	191,000	School, sewer	5-1/6	1.378
Middlebury, Conn.	545,000	School	10-1/3	1.304
Milton, Mass.	400,000	School	5-1/2	1.156
Multnomah Co., Ore.	500,000	Road	9-1/4	1.3235
Nashville, Tenn.	350,000	Street	14-1/3	1.3465
Norwood, Ohio	250,000	Off-street parking, park, playground	12-5/6	1.394
St. Charles, Mo.	180,000	Sewer	7-5/6	1.367
Sanders Co., Mont.	110,000	Bridge	10-1/2	1.841
San Marcos, Texas	275,000	Water and sewer revenue *	17-1/3	2.073
Spencer, Iowa	146,000	Hospital	11-1/2	1.448
Watertown, Wis.	400,000	School	10-1/2	1.377
Westwood, Mass.	415,000	School	10-1/6	1.315
Worthington, Minn.	150,000	Hospital	8	1.574

* Payable solely from revenues of indicated utility. All other bonds are general obligations.

Conventions — When and Where

Conventions listed this month for the first time are indicated by an asterisk (*).

Feb. 6-8—Buffalo, N. Y.
ASSOCIATION OF TOWNS OF THE STATE OF NEW YORK. Annual Meeting (Hotel Statler). Exec. Sec., Edward F. N. Uthe, 91 State St., Albany, N. Y.

Feb. 7-9—Indianapolis, Ind.
AMERICAN WATER WORKS ASSOCIATION—Indiana Section. Annual Meeting (Hotel Lincoln). Sec.-Treas., George Fassnacht, State Board of Health, Indianapolis, Ind.

Feb. 14—Newark, N. J.
AMERICAN WATER WORKS ASSOCIATION—New Jersey Section. Winter Luncheon Meeting (Hotel Essex House). Sec., C. B. Tygert, Box 178, Newark 1, N. J.

Feb. 15-16—Ann Arbor, Mich.
THIRD IN-SERVICE TRAINING COURSE IN WATER-WORKS PROBLEMS. University of Michigan. H. E. Miller, Resident Lecturer, School of Public Health Building, 109 South Observatory St., Ann Arbor, Mich.

Feb. 21-23—West Lafayette, Ind.
INDUSTRIAL WASTE UTILIZATION CONFERENCE. Annual Conference. Purdue University (Memorial Union). Chrmn., D. E. Bloodgood, School of Engineering, Lafayette, Ind.

Feb. 26-March 1—Boston, Mass.
ASSOCIATED GENERAL CONTRACTORS OF AMERICA. Annual Convention (Hotel Statler). Dir., H. E. Foreman, 1227 Munsey Bldg., Washington, D. C.

***Feb. 28-Mar. 2—Atlantic City, N. J.**
NEW JERSEY MOSQUITO EXTERMINATION ASSOCIATION. Annual Meeting (Hotel Haddon Hall). Sec., Baily B. Pepper, New Brunswick, N. J.

March 1-3—New York, N. Y.
AMERICAN CONCRETE PIPE ASSOCIATION. Annual Convention (Hotel Waldorf-Astoria). Mng. Dir., H. F. Peckworth, 228 North LaSalle St., Chicago 1, Ill.

March 6-9—Atlantic City, N. J.
ASSOCIATION OF HIGHWAY OFFICIALS OF THE NORTH ATLANTIC STATES (Hotel Traymore). Sec., A. Lee Grover, State Highway Dept., 1035 Parkway Ave., Trenton, N. J.

March 9-11—Washington, D. C.
AMERICAN SOCIETY FOR PUBLIC ADMINISTRATION. Annual Meeting (Hotel Statler). Sec.-Treas., Laverne Burchfield, 1313 E. 60th St., Chicago 37, Ill.

March 11-15—College Station, Texas
TEXAS WATER AND SEWAGE WORKS ASSOCIATION. Annual Meeting (Texas A. & M. College). Exec. Sec., V. M. Ehlers, Director, Bureau of Sanitary Engineering, State Health Dept., Austin, Texas.

March 12-14—Milwaukee, Wis.
AMERICAN ROAD BUILDERS' ASSOCIATION. Annual Meeting (Hotel Schroeder). Pres., E. R. Needles, International Bldg., Washington, D. C.

March 13-15—Grand Rapids, Mich.
MICHIGAN HIGHWAY CONFERENCE. Annual Meeting (Hotel Pantlind). Bus. Mgr., A. O. Cuthbert, 120 Ottawa St., Lansing, Mich.

March 14-16—Atlantic City, N. J.
NEW JERSEY SEWAGE AND INDUSTRIAL WASTES ASSOCIATION. Annual Meeting (Hotel Chalfonte-Haddon Hall). Sec.-Treas., Michael S. Kachorsky, 345 No. Eighth Ave., Manville, N. J.

***March 15—Boston, Mass.**
AMERICAN WATER WORKS ASSOCIATION—New England Section. Annual Meeting (Hotel Statler). Sec., G. G. Bogren, Westen & Sampson, 14 Beacon St., Boston 8, Mass.

March 18-20—Chattanooga, Tenn.
SOUTHERN ASSOCIATION OF CHAMBER OF COMMERCE EXECUTIVES. Annual Convention. Sec.-Treas., Floyd Kay, Charlotte, N. C.

March 26-29—Lafayette, Ind.
PURDUE ROAD SCHOOL (Union Bldg., Purdue University). Exec. Sec., Ben H. Petty, Professor Highway Engineering, CE Bldg., Purdue University, Lafayette, Ind.

***March 28-29—Chicago, Ill.**
AMERICAN WATER WORKS ASSOCIATION—Illinois Section. Annual Meeting (LaSalle Hotel). ec., J. L. Hart, U. S. Pipe & Foundry Co., 122 S. Michigan Ave., Chicago 3, Ill.

***March 30-April 1—Chicago, Ill.**
AMERICAN INSTITUTE OF PLANNERS Annual Meeting (Hotel Bismarck). Sec., Mrs. Ruth Bullerwell, Room 5-406A, 77 Massachusetts Ave., Cambridge 39, Mass.

***April 4-6—Chicago, Ill.**
MIDWEST POWER CONFERENCE. Annual Conference (Sherman Hotel). Sec., Edwin R. Whitehead, Illinois Institute of Technology, Chicago .6, Ill.

***April 5-6—Albany, N. Y.**
AMERICAN WATER WORKS ASSOCIATION—New York Section. Annual Meeting (Hotel Ten Eyck). Sec., R. K. Blanchard, Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.

April 11-13—Hays, Kans.
AMERICAN WATER WORKS ASSOCIATION—Kansas Section. Annual Meeting (Hotel Lamer). Sec.-Treas., Harry W. Badley, 640 Highland, Salina, Kans.

April 11-13—Hays, Kans.
KANSAS SEWAGE WORKS ASSOCIATION. Annual Meeting (Hotel Lamer). Exec. Sec., Dwight Metzler, Kansas State Board of Health, Marvin Hall, University of Kansas, Lawrence, Kans.

April 15-18—Miami Beach, Fla.
ASSOCIATION OF STATE PLANNING AND DEVELOPMENT AGENCIES. Annual Meeting (Hotel Sherry-Frontenac). Exec. Dir., Walter H. Blucher, 1313 E. 60th St., Chicago 37, Ill.

***April 19—Helena, Mont.**
MONTANA SEWAGE WORKS ASSOCIATION. Annual Meeting (Placer Hotel). Sec., H. B. Foote, State Board of Health, Helena, Mont.

***April 19-20—Lincoln, Nebr.**
AMERICAN WATER WORKS ASSOCIATION—Nebraska Section. Annual Meeting (Cornhusker Hotel). Sec., E. Bruce Meier, 201 Mechanic Arts, University of Nebraska, Lincoln, Nebr.

April 20-21—Helena, Mont.
AMERICAN WATER WORKS ASSOCIATION—Montana Section. Annual Meeting (Hotel Placer). Exec. Sec., A. W. Clarkson, Montana State Board of Health, Helena, Mont.

April 23-28—Dallas, Texas
MUNICIPAL FINANCE OFFICERS ASSOCIATION OF THE UNITED STATES AND CANADA. Annual Meeting (Hotel Baker). Exec. Dir., Joseph F. Clark, 1313 E. 60th St., Chicago 37, Ill.

April 29-May 4—Miami, Fla.
AMERICAN WATER WORKS ASSOCIATION. Annual Convention (Dinner Key and Municipal Auditorium). Exec. Sec., Harry E. Jordan, 500 Fifth Ave., New York 18, N. Y.

May 7-9—Chattanooga, Tenn.
AMERICAN PUBLIC POWER ASSOCIATION. Annual Convention (Read House). Gen. Mgr., Carlton L. Nau, 1757 K St., NW., Washington, 6, D. C.

***May 7-9—St. Louis, Mo.**
MISSOURI ASSOCIATION OF PUBLIC UTILITIES. Annual Convention (Jefferson Hotel). Sec., Hinkle Statler, Merchants Bank Bldg., 101 W. High St., Jefferson City, Mo.

May 7-11—Detroit, Mich.
NATIONAL FIRE PROTECTION ASSOCIATION. Annual Convention (Hotel Statler). Gen. Mgr., Percy Bugbee, 60 Batterymarch St., Boston 10, Mass.

May 8-11—Chicago, Ill.
AMERICAN INSTITUTE OF ARCHITECTS. Annual Convention (Hotel Edgewater Beach). Exec. Dir., Edmund R. Purves, 1741 New York Ave., NW., Washington 6, D. C.

May 13-18—Atlantic City, N. J.
NATIONAL CONFERENCE OF SOCIAL WORK. Annual Meeting (Hotel Traymore). Exec. Sec., Joe R. Hoffer, 22 W. Gay St., Columbus 15, Ohio.

***May 17-19—Vancouver, B. C.**
AMERICAN WATER WORKS ASSOCIATION—Pacific Northwest Section. Annual Meeting. Sec., O. P. Newman, Boise Water Corp., Boise, Idaho.

***May 21-23—Winnipeg, Man.**
AMERICAN WATER WORKS ASSOCIATION—Canadian Section. Annual Meeting (Royal Alexandra Hotel). Sec., A. E. Berry, Ontario Dept. of Health, Parliament Bldgs., Toronto 2, Ont.

***June 7-8—Springfield, Mass.**
NEW ENGLAND SEWAGE WORKS ASSOCIATION and NEW YORK SEWAGE AND INDUSTRIAL WASTES ASSOCIATION. Fourth Joint Meeting Hotel Kimball). Secs. (New England), Walter E. Merrill, 511A, State House, Boston 33, Mass.; (New York), Ralph E. Sweeney, 21 N. Broadway, White Plains, N. Y.

***June 27 or 29—Trenton, N. J.**
AMERICAN WATER WORKS ASSOCIATION. New Jersey Section. Summer Meeting (Inspection of De Laval Steam Turbine Company Plant, and Luncheon). Sec., C. B. Tygert, Box 178, Newark 1, N. J.

In-Service Training Courses

In Municipal Finance Administration

BEGINNING March 21 the Bureau of Government Research of Rutgers University will give for a period of eight weeks another of its in-service training courses in Municipal Finance Administration. The instructor will be George C. Skillman, Assistant Director of the Division of Local Government, and the place will be the Camden Campus of the University's College of South Jersey.

The previous similar course, given in New Brunswick, had an enrollment of 56 persons, over 40 of whom were municipal officials and employees. Members of the class came from 11 of New Jersey's 21 counties. The course was taught by Mr. Skillman, and the subjects discussed included: (1) Basic Statutes Affecting Fiscal Policy, (2) Municipal Revenues, (3) Taxes and Assessments, (4) Budget Preparation, (5) Local Bond Law, (6) Fiscal Duties of Municipal Officials, (7) Auditing and Reporting, and (8) Sound Fiscal Policies.

Those readers interested in further details may obtain them from the Bureau of Government Research, Rutgers University, New Brunswick, N. J.

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In Oak Park, Illinois, for example, 4800 Hy-Lite standards were installed in 1927. They've been on the job ever since—for 23 years—without a dime having been spent on maintenance! The pictures show another recent installation of the latest type Hy-Lite standards in this same community.

Equally important are the safety and efficiency benefits. Hy-Lite standards are designed to help distribute light most efficiently . . . meet all modern street lighting requirements.

Find out *all* the gains your community can make with modernized street lighting plus Hy-Lite poles. Send for complete information. Write to American Concrete Corporation, 4727 North Lamon Ave., Chicago, Ill.

Hy-Lite concrete lighting standards, Madison Street, Oak Park, Ill.

American Concrete

CENTRIFUGALLY SPUN-GRANITE CONCRETE LIGHTING STANDARDS

Extensive Sports Lighting Boosted Attendance 50%

By MARGUERITE CLARK
Department of Parks and Recreation
Phoenix, Ariz.

PHOENIX, Ariz, has completed three-quarters of a $225,000 field-lighting program under a million-dollar bond expansion program voted in 1948. When the program is completed, 120 acres of lighted recreation areas will be available at 7 park and 15 elementary-school playgrounds.

Is such a comprehensive lighting program worth the money? Phoenix park executives report immediate increases in playground attendance at 13 elementary schools amounting to 50%, or 70,000 persons.

Analysis of the attendance reports over the two years 1949 and 1950 showed the greatest increase in sports attendance—softball, baseball, football, and basketball—and in spectator attendance at athletic sports and games.

The lighting of 15 school playgrounds was the first project completed in May 1950 at a cost of $45,000. Johannessen & Girand, a Phoenix engineering firm, was employed to conduct a survey of existing conditions, make recommendations for the new lighting, design the various systems, and supervise construction. To minimize cost, all equipment was installed under one contract.

Lighting covers the entire play area at each playground by providing a well-lighted diamond for amateur softball games. Lighting intensities vary from 10 to 20 foot-candles for areas of 50,000 to 100,000 square feet. All wiring is overhead, with open-type 1,500-watt floodlights mounted on wooden poles 40 feet above grade level. The 15 areas used 485 reflectors and lamps, consuming 800 kilowatts.

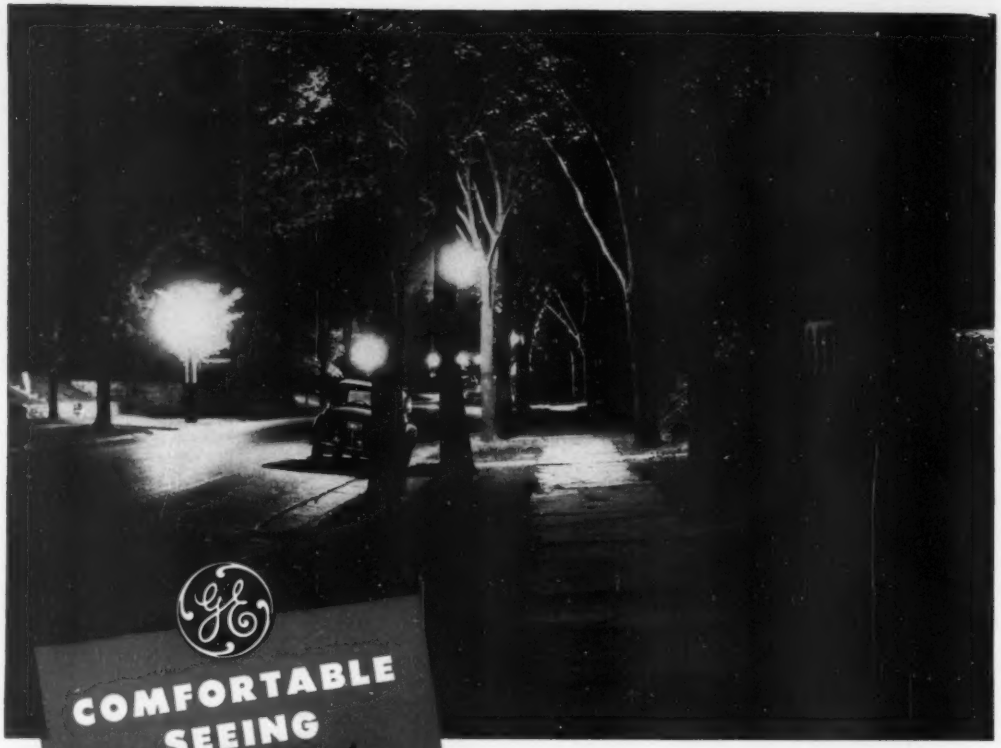
Harmon Park Lighting

Contracts for lighting of park playgrounds have been awarded, with about all of the developments under construction. One playground-lighting project —Harmon Park—has been completed, at a cost of $20,000. Since contracts are awarded in open bidding with specifications required to give equal opportunity to all suppliers, equipment is not standardized and products of several manufacturers are used on different projects. Construction methods have been standardized to the extent that all wiring is installed underground, and lighting units are supported on steel poles or structures.

Harmon Playground, located in a densely populated section of Phoenix, covers 11 acres. Lighted outdoor sports facilities include athletic fields, tennis courts, swimming pools, and general play areas. Baseball field lighting at Eastlake parks will make these two fields the best lighted in Phoenix, excluding the Phoenix Municipal Stadium, a city-owned, privately operated field used by professional teams such as the New York Giants, the New York Yankees, and the Phoenix Senators. Eight poles, constructed of steel-pipe sections 70 feet above grade level, support one hundred and four 1,500-watt enclosed-type floodlights. Lighting intensity is 25 foot-candles within the infield, with lamps operated at 10% above their voltage rating to increase the light by 35%. Energy is supplied from nearby transformers through four-wire, three-phase circuits. Magnetic contactors allow independent control of various sections of the system. The floodlights are Type L-69, manufactured by the General Electric Company. The front glass lens is heat- and impact-resistant, and spun-sealed permanently to the aluminum reflector with arrangement for servicing from the back of the unit. A combination of wide- and medium-beam light patterns are employed.

Contract for University, Eastlake, and the playground area at Encanto Park was let to low bidder for $115,000,

Phoenix youngsters play basketball and football on newly lighted Adams School Playground, which benefited from the city's playground-lighting program.



MAKES PLEASANT NEIGHBORHOODS

Like a welcome smile, good street lighting attracts people. It makes a community appear more attractive, prosperous and desirable. It is, in the words of a well-known official, the hallmark of a progressive community.

Well lighted streets are popular streets. With deep shadows gone, citizens feel safer—are safer. They appreciate the new freedom from fear of dark streets, the admiration of friends, and the compliments of visitors. As the mayor of Cleveland put it, "Civic pride goes hand in hand with civic accomplishment."

And good street lighting is appreciated. For example, in Vineland, N. J., when the new lights went on citizens were so pleased, city officials immediately ordered more of the new lighting. The Mayor of Beaver Falls, New York, put it this way, "Our new street lighting is the talk of the town."

Your electrical utility is vitally interested in your community's welfare. They have the know-how to help you modernize your street lighting quickly on an economically sound, planned basis. They can call on General Electric's services for planning and consultation.

G-E street lighting equipment has the flexibility to give you Comfortable Seeing engineered to meet the specific needs of your community. *Apparatus Department, General Electric Company, Schenectady 5, New York.*

Let your electric utility street lighting engineer show you how Comfortable Seeing SAVES YOU FAR MORE THAN IT COSTS.

GENERAL ELECTRIC

452-106

and a separate contract for picnic and general-use areas at Encanto was let for $27,000.

Encanto Park covers a wooded area of 40 acres, including 9 acres of lagoon and waterways, with an 18-hole golf course adjoining. In the general-use area, the completed lighting system consists of 100 light units, located along walks and planted sections. The system is to be energized from a 20-ampere constant-current series circuit with underground wiring. Each lighting unit accommodates a 6,000-unit (300-watt) lamp and is supported within an ornamental harp-shaped fixture of a steel pole 16 feet high. The base of the pole is fitted with ornamental iron casting which also serves as an enclosure for the wiring. The enclosed-type luminaires and pole ornaments are manufactured by the Philadelphia Electrical Manufacturing Company. The entire unit is painted "foliage green" to harmonize with surroundings.

Picnic and parking areas of Encanto are lighted with enclosed-type mercury luminaires manufactured by Line Material Company, using mercury lamps. Units are mounted on 30-foot steel standards, manufactured by Union Metal Manufacturing Company. Each standard is equipped with two 6-foot extension arms at pole top, permitting two luminaires to be mounted on each standard. Energy is supplied from constant-current circuit used for general-area lighting.

South of the picnic and general-use areas at Encanto is the 20-acre playground area. Illumination here will be furnished by the same type of unit used for general-use areas, on an extension of the constant-current underground lighting circuit. Game courts lighted in this area include 8 tennis courts, 16 horseshoe courts, 3 archery ranges (at light intensities adequate for tournament play), croquet, roque, and shuffleboard. The swimming pool and a large play area for children are also lighted. Floodlights used here are Type FLA, manufactured by Crouse-Hinds Company, and consist of open- and enclosed-type units utilizing 1,500-watt lamps. A transformer substation will be located centrally, in relation to lighting load of 212 floodlights.

University Park, an 8-acre area, will have lighted four tennis courts, the swimming pool, basketball courts, the general-use area, and the athletic field. A centrally located substation will serve 150 floodlights on 120-volt circuits. Floodlights will be identical in kind to those at Encanto Playground.

At Eastlake Park, over-all area illumination will cover the entire 10 acres. Lighting of the baseball field at Eastlake will be a major part of the program. Energized by individual oil-immersed transformers mounted on each supporting structure, 132 enclosed-type 1,500-watt floodlights will be mounted on eight 80-foot lattice-type steel towers. A remote-controlled oil switch, installed in the 2,400-volt, three-phase feeders serving the transformer group, will be the control. Floodlighting reflectors are Crouse-Hinds Type FLA, with heat- and impact-resistant front-glass lens, spun-sealed to the aluminum reflector, with the arrangement for rear service. Steel towers, manufactured locally by Allison Steel Manufacturing Company, will be installed. Lighting intensities will be 35 foot-candles throughout the infield area, with primary energy supplied to each supporting tower. Socket voltage is uniform, permitting economical group replacement of lamps.

Verde, Grant, and Central Parks will be lighted, with plans including illumination of swimming pools, tennis courts, outdoor stages, courts for basketball, volley ball, shuffleboard, and horseshoes, a softball field at each location, several play slabs and general-area lighting. Cost is estimated at $25,000.

No cost of operation is available on the Phoenix program. The school lighting program is estimated to cost $1.50 an hour for each field for electricity. To help offset expenses, facilities at Encanto and University Parks will be equipped with coin-operated time switches for individual control of game courts lighting.

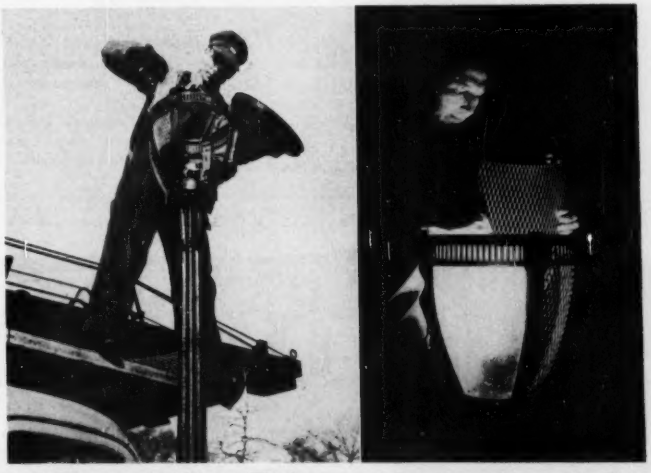
New Metal Guards for Park Luminaires

IN AN effort to cut park-lighting vandalism drastically, New York City has equipped 2,000 of its upright park luminaires with expanded metal guards. Vandalism over New York's entire lighting system of 170,000 units runs to 40,000 broken globes a year and costs close to $300,000 annually.

The new guards are made from dies owned by the Broadway Maintenance Corp., 22-09 Bridge Plaza North, Long Island City, N. Y., which services the lighting units. They are made of expanded metal manufactured by the Wheeling Corrugating Co., Wheeling, W. Va. An assembly for a 2085, or Type E, lantern, shown in the photographs, consists of four sections and costs $7.50.

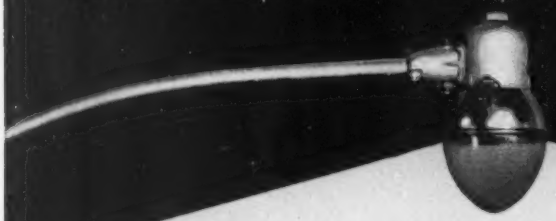
They are not used on New York's street and parkway luminaires, for here the intensity must not be reduced. Intensity on the paths of parks, however, is secondary, and here is where maximum vandalism occurs, many globes being broken ten times a year. Commissioner Dominick F. Paduano, of the Department of Water Supply, Gas and Electricity, City of New York, believes that the new guards will virtually eliminate lamp destruction in the parks.

Expanded metal, which used to be employed chiefly as reenforcing for concrete streets and roads, is made by piercing and stretching solid steel sheet. Today it is used for making safety stair treads, partitions, machine guards, etc. It has diamond-shaped openings and great resistance to impact.



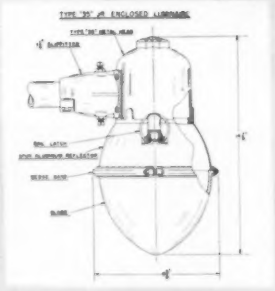
Left: Electrician installs new Wheeling expanded metal guards on a New York City park luminaire. Right: The purpose is to obtain normal life from the globes and lamps, because many of the park units are broken 10 times in a year.

JUNIOR LUMINAIRE
By
JOSLYN



IDEAL FOR RESIDENTIAL AREAS

BEAMS THE LIGHT FOR GREATEST EFFECTIVENESS ON THE STREET



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The Joslyn Junior Luminaire will give you a compact, low cost, glassware enclosed light source embodying the same advantages of scientifically controlled illumination available with larger, more expensive luminaires.

1. For 1000 and 2500 lumen incandescent lamps.
2. Available now in I.E.S. Types IV & V Light Distributions.
3. Slip-Fitter or Top-Mounted Cast Aluminum Head for Inner Wiring.
4. Highly polished Alzak* Spun Aluminum Reflector to which globe is attached by means of the highly successful Joslyn wedge band construction.
5. With W.P. Series, D.P. Series Receptacle, or Mogul Multiple Socket (with standard head) or with Medium Multiple Socket (with smaller head as shown above).

*Mfg. under Aluminum Co. of America Patents.

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Complete Pole Line Equipment

20 NORTH WACKER DRIVE, CHICAGO 6, ILL.

Street Luminaires for Interiors of Chicago's Lincoln and Garfield Park Conservatories

By FRANCIS D. WYATT
Electrical Engineer
Chicago Park District

PROBABLY the first public installation of color-corrected mercury lighting in the country enables night visitors to Chicago's Lincoln and Garfield Park Conservatories to see the exhibits in their true foliage and flower colors.

The use of the new lamps does away with the former necessity of using incandescent lamps combined with the old-type mercury lamp as a means of correcting for color, which even then was deficient in showing the true color spectrum. The color-correction feature was obtained through the help of Westinghouse electrical engineers, who designed a new 400-watt, 20,000-lumen mercury lamp and coated the interior surface of the central section of the outside glass tubing with a phosphor compound. An extra advantage is the elimination of annoying shadows.

An individual unit lowered for servicing by means of a Thompson hanger.

With this lamp we have reduced not only operation cost but also maintenance costs in cleaning and repair, by housing the lamps in a luminaire supported by a Thompson disconnecting and lowering lamp hanger. Use of the hangers makes possible maintenance and replacement from the floor level.

PHOTOS COURTESY CHICAGO PARK DISTRICT

How the street-lighting luminaires are mounted in the Garfield Park Conservatory. Reasons for selecting these fixtures were high humidity and extremely high mounting heights, closely simulating an outdoor installation. The units must also stand sprinkling from a hose which is used to wash down the plants.

Complete reports as to the life-length of the new lamps are as yet not possible None of the lamps has had to be replaced during the last year and they show signs of long-life possibilities.

The new color-corrected J-HI mercury lamp has the unusual feature among lamps of bulging at the center. This design provides a more equal operating temperature over the entire bulb wall and permits the phosphor to do its job at greatest efficiency, according to Westinghouse designers.

The color-correction quality of the lamp is obtained when the invisible ultra-violet light produced by the electric-vapor arc in the lamp acts on the phosphor to produce a fluorescence of red color to balance the mercury spectrum, and provide a light which closely approximates white daylight. White is the only color which scientifically contains all the colors of the spectrum.

The Westinghouse Electric Corporation expects that the new lamp will find its principal usefulness in floodlighting and in street lighting.

Mercury-Vapor Lights on Colorado Valley Highway

INSTALLATION of 289 of the latest type of mercury-vapor street lights recently started along the first 2.1 miles of Denver's portion of the new $20,000,000 Colorado Valley Highway. According to Mark U. Watrous, State Highway Engineer, they are the first of 1,800 which ultimately will light the 12-mile stretch of highway within Denver's city limits. Colorado Public Service Company will install them.

These General Electric luminaires will be mounted on Union Metal poles spaced 90 feet apart on alternate sides of the highway. Suspended on 15-foot bracket arms, they will be approximately 30 feet above the pavement. The material was purchased from the Graybar Electric Company. Charles O. Woodworth, Public Service Company lighting engineer, says that because the mercury lamps are burned horizontally instead of vertically, "they direct 50% more light onto the pavement." Cost of operating the highway-lighting system within Denver will be borne by the city, according to Henry A. Barnes, City Traffic Engineer.

*MORE TRANSIT LINES ORDER TRACKLESS TROLLEY COACHES

NEARLY 800 electric trackless trolley coaches have been ordered by transit systems in the United States and Canada during the past few weeks. This number, plus a considerable backlog which will not be delivered until next year, will swell the total of 1951 deliveries to over 1,500 trolley coaches. This more than doubles the 698 trolley coaches delivered in 1949.

These vehicles and the electrical equipment necessary for trolley coach systems represent an investment of more than $50,000,000. It is due in part to the desire of public transit companies in the two countries to be ready for any possible emergency, should liquid fuel face rationing.

EXPECT PRIORITIES

Defense authorities have indicated that the public transit industry will shortly be designated as essential, and the Department of Labor has already placed the industry in an exempt position for certain manpower classifications. It is also believed that production authorities will give a particular nod to increased production of streetcars and trolley coaches because of their use of electrical power, which has never been rationed.

In 1940 the public transit industry was carrying an average of 13 billion passengers yearly. Currently about 18 billion passengers are being carried. Industry leaders estimate that tire and gasoline rationing would send the figure as high as 26 billion annually.

There were slightly over 2,000 trolley coaches in transit service prior to World War II. This figure has risen steadily as trolley coaches have been placed in service to replace abandoned streetcar lines and as replacements for overburdened city bus lines. Nearly 8,500 are now in service and with 1951's deliveries completed, the figure will reach 10,000.

Because trolley coaches start immediately at sub-zero temperatures with no preheating of their electric motors, it is not necessary to build garages except for their minimum maintenance; the vehicles can be stored in open lots. This is a considerable saving, as transit systems have found that the cost of garages equals the cost of their motor vehicles. Maintenance charges are very low, and less skilled manpower is needed to keep them in running order.

Although trolley coaches show most favorable earnings under adverse war operating conditions, they have been able to show impressive financial gains for transit companies which have been caught between rising costs of labor and materials and fewer customers.

PROFITABLE IN BROOKLYN

The 200 trolley coaches are the only surface vehicles in Brooklyn making a profit for the Board of Transportation. San Francisco, in reporting its first transit operating profit in ten years, gave credit to the earnings of trolley coaches which were able to offset losses from other types of vehicles.

Many privately owned transit systems declare that the lower cost of operating trolley coaches has helped save them from bankruptcy.

*Reprinted from THE JOURNAL OF COMMERCE, Oct. 27, 1950

151-27

GENERAL ELECTRIC

Automobiles and Lamp Posts Stop Fighting in St. Paul Parks

SOMETIMES the street-lighting standard lost, and then again it would win (see cover of this issue). Either victory was deplored by George M. Shepard, Chief Engineer of the St. Paul, Minn., Department of Public Works, and W. Lamont Kaufman, General Superintendent of Parks. Could the combats be discontinued without special warning signs, which would hardly beautify the parkways? What was done is shown in the pictures.

The method was first tried in the fall of 1949 on the curb and light post of a single center island on Summit Avenue, where several accidents had shattered the post, even after warning signs had been installed. City employees applied silver Scotchlite solidly to the curved concrete curb and in strips fitting the flutings of the post and the base collar. Since then there have been no wrecks on this island. "Even during the winter months when the curb was covered with snow, the reflectorized post continued to keep motorists alert," says Mr. Shepard.

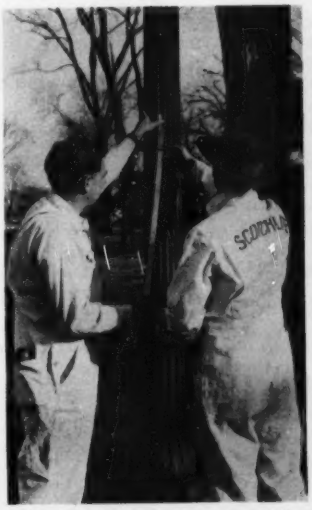
Today, 38 light posts and the trunk of one tree at three separate, congested traffic areas on Summit Avenue have been reflectorized to delineate roadway outlines. Each post has six 36-inch strips of 1-inch-width Scotchlite running vertically in the column's flutes above the post's collar. Below the collar either five or six strips fan out to the base on which are horizontal strips. Because the posts alone did a satisfactory job of delineating the roadway, no additional curb markings were applied.

General Improvement Plan

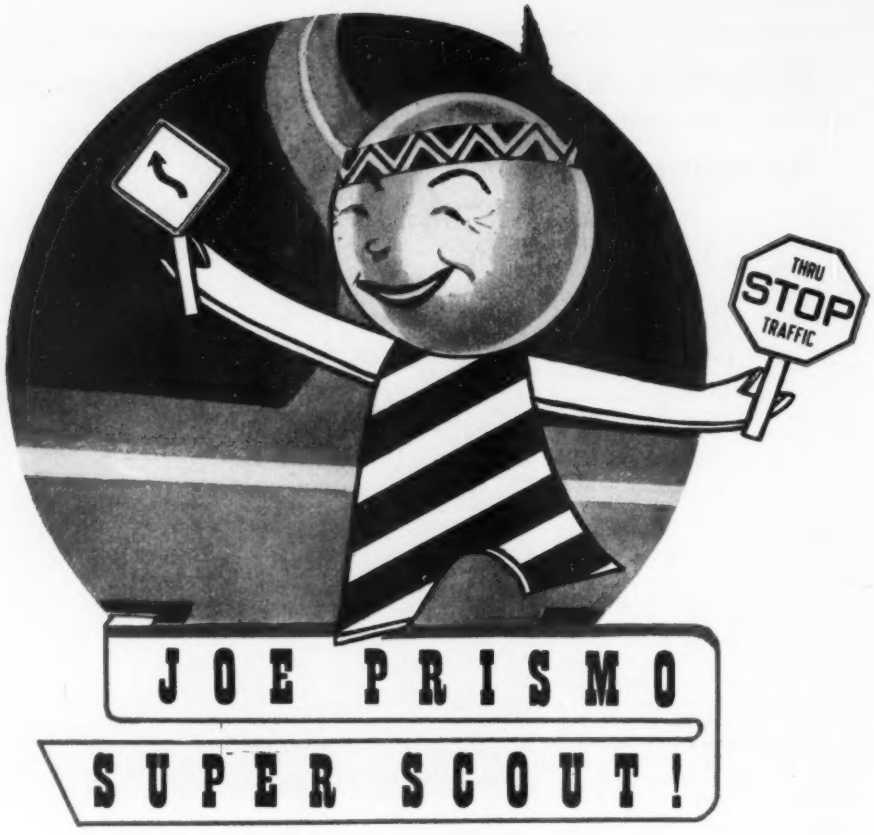
In conjunction with the Summit Avenue reflectorization, the city also set in motion a fourfold general-improvement plan for the thoroughfare. It included reconstruction of curbing, streamlining of congested traffic lanes, roadway resurfacing over a three-mile stretch, and installation at danger points of 11 new General Electric mercury-vapor luminaires of 21,000 lumens each.

In addition to the Summit Avenue job, St. Paul has also reflectorized its Wheelock and Johnson Parkways, Edgecumbe Road, and the thoroughfares in both Como and Phalen Parks. Small rectangular "swatches" and wraparound strips were used on the curbs, trees, and posts to delineate roadways and mark off danger spots. Their service life is at least six years, according to Mr. Kaufman, and the markings are not usually conducive to vandalism.

St. Paul reflectorized its park-light standards, and automobile collisions with them have almost stopped. A previous crash is shown on the cover of this issue. Here is how Summit Avenue appears to the eastbound motorist at night.



Left: Scotchlite strips are applied to the flutings, and a clamp-wick device is run the length of the strip to make it stick. Above: A close-up of a finished lamp post. The strips are inconspicuous during the daytime.



On better roads and super-highways across the country, Joe Prismo scouts the way in advance. He marks the life-lines, curves, crossings and danger spots with a dependable long range reflective glow of safety.

In all weather and under the most gruelling traffic conditions Prismo Products stand up. The combination of perfectly round crystal spheres held in a "bull-dog grip" by a tough plastic binder reflect safety with long-lasting brilliance. This enduring quality of Prismo Products make them a budget-wise choice of all economy-minded road engineers. To maintain their high road-life standards, Prismo Laboratories' development technicians are constantly testing and improving both the reflective products and methods of application to produce new economies in traffic marking service. Write today for fully informative booklets explaining Prismo Products and methods of application. No obligation of course.

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The SPHERE of SAFETY

How Not to Install Parking Meters

By HERBERT B. KIMZEY
City Attorney
Cornelia, Ga.

FROM the beginning of parking meters this magazine has stressed again and again the importance of installing meters to relieve curb congestion and not primarily to obtain new revenue. The experiences of Cornelia, Ga., are a reminder of this principle and of other factors which should be worked out before installing meters.

CORNELIA is a small town in the foothills of the Blue Ridge Mountains. It is located at the junction of the Tallulah Falls Railway with the Southern Railway and is the trading and business center for Habersham County, although not the county seat. Its population in 1950 was 2,428, a gain of over 34% from 1940. It derives its trade largely from the surrounding area, and its trade is about equally divided between agricultural workers and industrial workers in the plants recently constructed here. It may be said to be about the average city of its size for this section of the country.

In February 1948, the City Commission, without prior notice, signed a contract for installation of 140 parking meters on the streets of Cornelia. Immediately there was a strong protest from the merchants and business and professional men here. These protests were disregarded, and the meters were installed and placed in operation.

At the request of its members, the Cornelia Chamber of Commerce mailed a questionnaire to every box holder on the rural routes of the trade area and to each box holder in Cornelia and the neighborhood towns asking for an expression of opinion on the use of parking meters in Cornelia.

Shoppers and Merchants Opposed

There was the question of good will for the community among its rural traders or shoppers. Many of these felt they were being imposed on by being charged a nickel an hour to trade here. Although an effort was made to persuade them that the meters were actually for their benefit, to provide them a place to park without having to walk long distances, many of them continued to feel that it was an imposition. The fact that some merchants of these nearby towns placed advertisements in the local papers, saying, "Trade at ....., Free Parking," did not help the feelings of the local merchants here.

A big mistake was made when 140 meters were installed, when the company recommended that only 70 meters be installed. In other words, the city officials placed the meters in areas where there was no parking problem, to obtain the revenue it gave the city. In my opinion, this was one of the most serious complaints against the use of parking meters. Had a reasonable number been placed on the streets in the more congested parking areas only, I doubt if as much criticism would have been raised to their use.

A minor complaint was made that the meters were in front of some places of business in the center of the business district, but not in front of those places of business in neighborhood shopping centers away from the center of town. By placing the meters only in congested parking areas, this complaint could have been easily adjusted to the satisfaction of all reasonable parties.

Concurrently, the City Commission called for a referendum vote of the qualified voters of the city on the continuance of the meters: 183 voted in favor of the meters and 165 voted for their removal. This showed that 52.5% of the city registered voters were in favor of the meters, while 47.5% were opposed to them.

The chief complaint had been from rural traders and from merchants depending on rural trade.

Of the 2,006 box holders questioned by the Chamber of Commerce, 861 promptly replied, showing that 42.9% had definite opinions on the subject. Of these, 447 were opposed to parking meters in Cornelia, or 51.9%; and 414, or 48.1%, were in favor of them. The replies further showed that a predominance of the rural people were opposed to parking meters in Cornelia.

In the city election held in December, candidates pledged to remove the parking meters were elected and the contract was canceled as provided by its terms. Such was the experience of Cornelia with parking meters.

Unintelligent Enforcement

The principal criticism here was the manner in which use of the meters was enforced by the local policemen. When the meters were first installed, instead of being courteous to those who failed to place sufficient funds in the meters for the time used, the local police acted as if each violation was an attempt to defraud the city.

This was bad enough when men were given traffic summonses. When it came to the lady drivers, the discourtesy created ill will for the community throughout the entire trade area. Irate fathers, husbands, and brothers protested that their daughters, wives, or sisters had been insulted or disrespectfully talked to by the local officers when they protested their innocence. Whether these protests were justified or not, is not for me to say. I will say that after the meters were discontinued some of the policemen were discharged for discourtesy towards tourists and out-of-town people trading here.

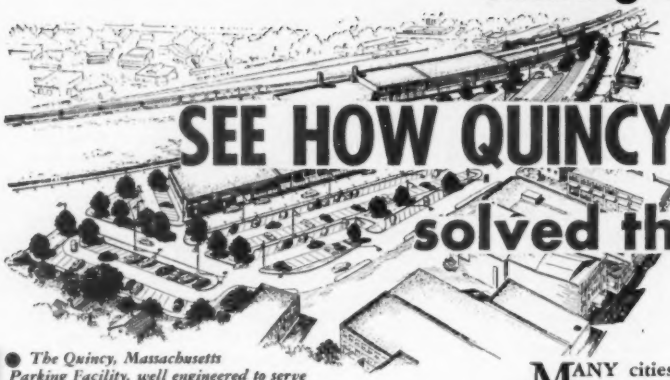
While the tax rate in Cornelia, $1.50 per $100 valuation of property, is among the lowest in the state for a city of its size, many citizens felt that they were paying enough taxes already and that the parking meter tolls were merely an additional tax placed on them. Considering the fact that both the meter company and the City Commission stressed the amount of revenue to be received from the meters, this feeling is easily understood.

New Garage Construction In Minneapolis

MINNEAPOLIS has a garage program consisting of three multi-level off-street parking structures with a combined capacity of 1,800 automobiles in strategic locations in Minneapolis. It had been the intention of the city to finance and build these, but downtown property owners decided that they could and would solve the problem themselves. They formed the Downtown Auto Park, Inc., and within a short time nearly $1,000,000 in common stock was subscribed by local business firms and property owners. A mortgage loan commitment in the amount of $2,200,000 was obtained from Northwestern Mutual Life Insurance Company.

Downtown Auto Park, Inc., retained the services of National Garages, Inc., of Detroit, as parking consultant and project manager. The organization retained the firms of Larson and McLaren, architects, of Minneapolis, and D. L. Briegel and Associates, consulting engineers, of Detroit, to design and prepare working drawings and specifications of the proposed parking structures and to supervise their construction. They will be of the open type with six parking levels, including a basement, street-level floor, and four upper floors. Construction is about to start on the first of the three garages.

Is parking Congestion chasing away Business?



SEE HOW QUINCY and DUALS solved the problem!

● *The Quincy, Massachusetts Parking Facility, well engineered to serve the largest shopping center on the South Shore.*

● *Grading under way, an initial step to provide sufficient parking area, conveniently arranged for maximum utility.*

● *This view shows how area was laid out to achieve interesting and attractive appearance as well as efficient use of space.*

● *One of the walkways, an important safety feature, showing installation of Dual Parking Meters which serve the entire facility.*

MANY cities are facing a serious new parking problem. Shoppers are by-passing business areas where it is hard, or impossible, to find parking space. Merchants lose business. Property owners lose tenants. And municipalities foresee deteriorating business sections.

Quincy, Massachusetts, tackled such a problem, came up with a planned program that makes a world of difference. The city took over an unsightly central area, transformed it into an outstanding parking facility. Traffic control, color texture pavements, traffic channels, landscaping and floodlights were installed. And—Dual Automatic Parking Meters went on the job.

Result—the lot cares for 5,000 cars per metered period. Traffic turnover has increased 300 per cent. Merchants around the area have retained and regained customers—have even "face-lifted" their stores!

This exceptionally well-planned, off-street parking facility shows how a serious problem can be overcome. And with Duals, parking control is simplified to the utmost. These rugged, dependable, automatic meters make parking easy for motorists. They're investments that pay dividends in good business, good will, and at remarkably low maintenance.

THE DUAL PARKING METER COMPANY
A subsidiary of The Union Metal Manufacturing Company
Canton 2, Ohio

SEND FOR DETAILS—Ask for Bulletin DU-505 on "Off-street Parking"; Bulletin DU-504 on the latest Dual "on-street" *Gearshift* Automatic.

For the NEWEST features... **LOOK TO DUAL** The ORIGINAL Parking Meter

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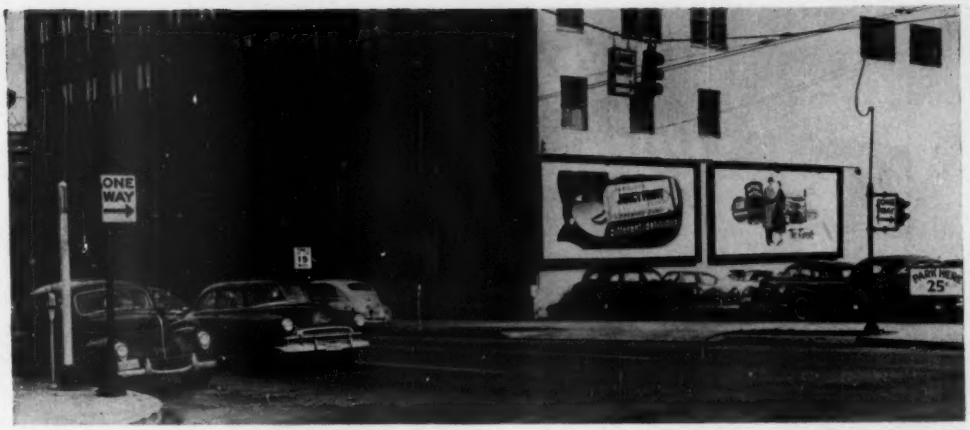

Day and night views of fluorescent-lighted signs used in the one-way traffic-grid system of Portland, Ore.

Fluorescent-Lighted Traffic Signs Successful in Portland, Ore.

By FRED T. FOWLER, *Traffic Engineer*
Portland, Ore.

THESE PHOTOGRAPHS of illuminated traffic signs illustrate the successful conclusion of two years' development in Portland, Ore. Our first trials were with signs with fluorescent-tube units fastened over the top. These were not satisfactory because of uneven illumination in darkness and because of shadows cast by the light unit during daylight hours.

The use of glass in overhead signs could not be recommended, but the development of plastics such as Plexiglas offered a material that was satisfactory for the front of a sign. The Plexiglas used was white translucent and the sign indication was put on the outside by the silk-screen process. Signs can be easily removed from the plastic and renewed or changed as desired. Experiments proved that 3/16-inch plastic is best for signs of this size.

These signs were made for us on bid by the Elwood Wiles Company, of 532 S. E. Belmont St., Portland, Ore., the company that conducted the early experiments with this type of signs for us. They consist of four major parts: the two cold-cathode fluorescent tubes; the white Plexiglas front on which the sign is printed; a transformer, known as a ballast; and an aluminum box containing the entire unit. Light from the tubes passes through the translucent Plexiglas and gives the sign exceptional brilliance.

The transformer, made by the Sola Electric Co., Chicago, is the key to the sign's success because it solves the problem of voltage variations that made past experiments with fluorescents ineffective. If nothing is done about it, voltage variations cause the light to flicker, grow dim, or even fail completely. The Sola constant-voltage transformer takes incoming voltage varying anywhere from 95 to 130 and converts it to the specific voltage for which the light tubes were designed.

The original units were installed in the late fall of 1948 and were in service through the winters of 1948 and 1949, in temperatures as low as 3 degree above zero.

A traffic sign which has been opened to show the two cold-cathode tubes and Sola constant-voltage transformer.

BROOKLYN TROLLEY COACHES

please the public and make money doing it

Two years ago the New York City Board of Transportation began adding trolley coaches to its Brooklyn fleet of surface transit vehicles. Now 200 silver and green coaches operate on seven routes in New York's biggest and most populous borough.

Each line has carried more riders after the conversion to trolley coach than it did during the period preceding conversion. The increases came when over-all riding on Brooklyn surface lines was dropping.

Trolley coaches on the Lorimer and Tompkins Avenue lines demonstrate the system's ability to handle large loads effectively. They serve Ebbets Field, home of the Brooklyn Dodgers. Many times during the baseball season the stands are filled to their 35,000 capacity. A large percentage of the fans prefer to come and go by trolley coach.

Brooklyn trolley coaches please the public, and earn a profit while they do it. For the fiscal year ended June 30, 1950, they returned a net of $176,404.

Rider appeal and the ability to earn profits—these two big advantages of the trolley coach show clearly in Brooklyn just as they do in many other cities.

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Ohio Brass

TROLLEY COACH AND STREETCAR LINE MATERIAL AND CAR EQUIPMENT

Municipal and Civic Publications

Water Quality Manual

WATER QUALITY AND TREATMENT—*Second edition. American Water Works Association, 500 Fifth Ave., New York 18, N. Y. 450 pp. $5.*

The American Water Works Association lists this as a manual, but by any logical standard it should properly be a reference text and should be included in the library of every public official and engineer concerned with this subject. It carefully lists all useful water standards, discusses treatment process, analyzes water softening, and gives information on fluoridation.

Environmental Sanitation Volume II

PUBLIC HEALTH ENGINEERING, *Vol. II—By Earle B. Phelps. John Wiley and Sons, 440 Fourth Ave., New York 16, N. Y. 213 pp. $4.*

This second volume discusses the third phase of environmental sanitation, the "food contact." Volume I covered air and water. Volume II was prepared in collaboration with Walter Tiedeman, Chief of Milk and Restaurant Sanitation, New York State Department of Health. Volume II will be convenient to officials responsible for food-handling sanitation, and has much useful information. The final chapter is disappointing, however. Its coverage of the important field of refuse sanitation is, at best, superficial.

A Conservation Guide Book

CONSERVATION OF NATURAL RESOURCES—*Edited by Guy-Harold Smith. John Wiley and Sons, Inc., 440 Fourth Ave., New York 16, N. Y. 1950. 552 pp. $6.*

This is an exceedingly comprehensive and up-to-date compendium of the conservation movement and conservation practices in the United States. It is the combined work of 20 men who have specialized in the study of different resources. They tell what can be done to develop a successful conservation program. Among the major sections are those on soil conservation, which includes chapters on tree crops, grassland resources, and irrigation practices; forest resources; water supply, power, and flood control; mineral conservation; wildlife and fisheries; recreational resources, and the conservation of man.

Perhaps the weakest chapter, from the standpoint of being too general, is that on state and local planning. This chapter is included with an excellent chapter on national planning in the concluding section of the book. It stresses the importance of planning for the conservation of our resources on a regional basis.

Public Relations Programs

PUBLIC RELATIONS PROGRAMS—*By Sallie E. Bright. National Publicity Council for Health and Welfare Services, Inc., 257 Fourth Ave., New York 10, N. Y. 1950. 44 pp. $1.*

This is a detailed analysis of the nine basic steps in public-relations planning for social service, health, educational, recreational, and civic organizations—a practical guide for building sound community relationships. The booklet gives numerous examples of public relations projects, and offers suggestions which any organization, however limited in staff and funds, can put to use. There are check lists of questions which need to be considered in building a partnership with the public.

The booklet points out that the extent to which any organization will be permitted to serve the community depends directly on how much people understand and how they feel about the needs it is attempting to meet, about the methods it is using to meet them, and about the quality of its performance. A sound public relations program is directed to these three points, to the end that people may be better served.

National Water Policy Report

A WATER POLICY FOR THE AMERICAN PEOPLE—*Vol. I. General Report, The President's Water Resources Policy Commission, 718 Eighteenth St., NW., Washington 25, D. C. December 1950. 445 pp. For sale by the Superintendent of Documents, Government Printing Office, Washington 25, D. C.*

This is a monumental and comprehensive report whose major recommendations are summarized on pages 83 and 84 of this issue. Volume II will contain the details of 10 river-basin studies, and Volume III is devoted to Water Resources Law. The series will be found of value of all officials concerned with the use and development of municipal water supplies.

Fire Fighting Story

GOING TO BLAZES—*By Robert V. Masters. Sterling Publishing Co., Inc., 141 East 44th St., New York 17, N. Y. 1950. 144 pp. $3.50.*

This is an informative and excitingly written book, which should be of interest to fire chiefs and defense administrators, as well as the average citizen. The book tells in words and pictures the story of fire in America. It shows what happens when fire gets out of control. It points to the pressing need for speed-up in our fire-fighting plans. It has an important section on fire bombing, and a chapter on basic fire-fighting for individuals, as developed by the British Government.

The book shows the latest in equipment, tells how fire departments are organized, describes the work of volunteers and auxiliary firemen, and notes how "buffs" can be important in emergencies.

There are first-hand accounts from fire chiefs, firemen and others on the scene about most of the major conflagrations and epochal fires which have taken place in the United States.

What Goods Does America Need?

AMERICA'S CAPITAL REQUIREMENTS—ESTIMATES FOR 1946-60—*By Robert W. Hartley with the collaboration of Eleanor Wolkind and assisted by Maynard Hufschmidt and Sidney Jaffe. The Twentieth Century Fund, 330 W. 42nd St., New York 18, N. Y. 1950. 244 pp. $3.*

The Capital Requirements report is a supplement to the report on America's Needs and Resources which the Twentieth Century Fund published in 1947. Estimates were prepared for use in the original study. They have now been extensively revised. The estimates are grouped in four main fields: urban development, commercial and industrial facilities, transportation, and rural development. These, in turn, are broken down into 28 general fields which represent nearly 90% of non-military capital expenditures in this country. The 123 tables in the text and in the appendices give figures on past expenditures as well as estimates of future needs. In determining the most pressing requirements for capital goods, the authors rank population growth and economic expansion first, then obsolescence, and finally the necessity to make up backlog requirements. In other words, roughly 30% of future capital outlays are estimated to be required for net expansion, 50% for replacement of goods being worn out, and 20% to meet backlog deficiencies.

Michigan Planning Setup

PLANNING THE COUNTRYSIDE—*By Charles W. Barr. Michigan State College Press. 1950. 86 pp. $1.50.*

The mechanics for community planning in Michigan are here described in some detail. As the text explains the pattern of government power for planning and the various phases of physical planning, an elaborate system of footnotes refers to the legislative acts (dates and sections) which cover the points mentioned. The final chapter contains recommendations for further legislation to cover newly arising needs.

Health Services For Civil Defense

HEALTH SERVICES AND SPECIAL WEAPONS DEFENSE—*Federal Civil Defense Administration, Executive Office of the President. United States Government Printing Office, Washington 25, D. C. December 1950. 250 pp. 60 cents.*

This volume gives in detail the information required by state and local planners for civil defense health services against atomic, biological, and chemical warfare. It was prepared for the Federal Civil Defense Administration by the Health Resources Office of the National Security Resources Board, with the assistance and technical advice of a number of federal and private agencies.

The book describes how completely mobile first-aid stations can be organized, and estimates the quantity of supplies and equipment which such stations will need. There are chapters on the leadership of civil defense health services; training; expansion of existing hospitals and the creation of improvised hospitals. Health supplies, water and sanitation services are also discussed, together with special health services, which include the care of non-casualty critically ill persons during a disaster.

There are additional chapters on pediatric services; services for mothers and infants; mental health services; dentistry; nursing and pharmaceutical services; nutrition services; laboratory services; industrial health services; veterinary services; vital records and reports; and mortuary services.

Of particular importance in this volume is the emphasis it places on the need for civil defense against biological warfare.

Fire Effects of Bombing

FIRE EFFECTS OF BOMBING ATTACKS—*Prepared for the National Security Resources Board by the Civil Defense Liaison Office, Office of the Secretary of Defense. November 1950. 45 pp. For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 15 cents.*

This is a study designed to give guidance and assistance to civil defense fire-fighting services in preparing to combat mass fires in time of war. Section I presents a summary of the mass of data on bombing attacks in World War II, taken from the reports of the U. S. Strategic Bombing Survey, and presents problems of extinguishment and control of mass fires resulting from bombing. Section II discusses the principal factors of susceptibility characteristic of all cities, and suggests a method of appraising them for the purpose of defending American municipalities.

How to Size Up A-Bomb

HOW TO SIZE UP THE ATOM BOMB—*Reprint from Power Magazine. Order from Editorial Dept., Power, 330 W. 42nd St., New York 18, N. Y. 16 pp. Illus. 25 cents for single copies.*

The three articles contained in this reprint are designed to be of particular interest to engineers. They are soundly technical in a practical sense, but not highly theoretical. Excellent illustrations aid greatly in making the concisely written editorial material of maximum value.

The Latest in Roadside Development

HIGHWAY RESEARCH BOARD REPORT OF COMMITTEE ON ROADSIDE DEVELOPMENT—*Published by the Highway Research Board, Division of Engineering and Industrial Research, National Research Council, Washington 25, D.C., November 1950. 110 pp. $1.50.*

These reports cover shoulder problems, roadside grading and drainage design, erosion control and planting, wayside areas for rest and recreation, and border services and investigations. There are many fine illustrations, maps, and drawings throughout the text.

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James A. Stire

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Study of Public Opinion and Government

PUBLIC OPINION AND POLITICAL DYNAMICS—*By Marbury Bladen Ogden, Jr. Houghton, Mifflin Company, 2 Park St., Boston, Mass.* 1950. 362 *pp.* $3.50.

The purpose of this book is to attempt an analysis of the nature of public opinion and its role in democratic and other societies. Every effort has been made to see beyond the purely technical problems involved in the study of opinion, the dissemination of propaganda, or the measurement of its effect. However, enough consideration has been given these subjects to acquaint the student with the scope and nature of the field.

More than half of the work has been devoted to analysis of the relation of opinion to government, to definition of the terms "opinion" and "public," and to the major forces, social and psychological, which affect the formation of opinion.

The later chapters are a good introduction to the techniques of opinion dissemination, such as the press, radio, and motion picture, and they also present material on the measurement of public opinion.

The book will be found useful by all interested in municipal public relations.

Philanthropy Analyzed

PHILANTHROPIC GIVING — *By F. Emerson Andrews. Published by the Russell Sage Foundation, 505 Park Ave., New York 22, N. Y.* 1950. 318 *pp.* $3.

The author, a staff member of the Russell Sage Foundation, has devoted two years to making this comprehensive survey of philanthropy, and has come up with some interesting statistics. For instance, philanthropic giving in the United States in the last 20 years has risen from $1,200,000,000 to $4,000,000,000. The lowest-income groups give proportionately the largest share of private aid, with the highest-income groups second, and the middle-income group third.

The suggestions toward more effective giving are practical and helpful, and should be read by anyone planning to make a bequest. Of considerable interest to community leaders are the discussions on private contributions versus expanding public activities in such fields as health and welfare. The importance of coordination of community fund-raising activities is also stressed. Other chapters include those on taxation factors, financing research, the recipient and the donor, and education and the arts.

Urban Redevelopment Critique

CITY DEVELOPMENT, EXPERIENCE SHOWS THAT THE AVERAGE CITY CAN BEST ACHIEVE IT IN SMALL PIECES WITH THE AID OF LOCAL CAPITAL AND LOCAL ENTERPRISE — *By Henry S. Churchill. Article in December 1950 issue of* Architectural Forum, *pp. 72-77. Reprints available from author at Churchill-Fulmer Associates, 19 W. 44th St., New York, N. Y.*

An excellent analytical progress report on what has been done thus far under the urban redevelopment section of the Housing Act of 1949 in several major U. S. cities, including Philadelphia, Baltimore, Providence, Chicago, Nashville, and Indianapolis. The author urges a realistic approach to the obstacles which have hampered the various programs. He asks especially greater attention to smaller projects, which can be handled by local financial resources, and thus be realized step by step in accordance with a long-range master plan.

New Jersey Pensions

PENSION LEGISLATION FOR PUBLIC EMPLOYEES IN NEW JERSEY—*Published by the Bureau of Government Research, Rutgers University, New Brunswick, N. J.* 1950. 59 *pp.* 50 *cents.*

This study is a classification and summary of the 101 contributory and non-contributory plans authorized by law affecting state, county, municipal, and school district employees. It is strictly objective in character and is designed to provide a handy reference guide to the legislation in this field.

National Municipal League's Work in Municipal Reform

A HALF CENTURY OF MUNICIPAL REFORM — *By Frank Mann Stewart. University of California Press, Berkeley 4, Calif. October* 1950. 289 *pp.* $5.00.

This study records the history of the National Municipal League, outlines the conditions which brought this remarkable citizens' organization for better government into existence, describes its program for the improvement of local government, analyzes its methods, techniques, and problems, and evaluates the contribution of the League to fifty years of municipal reform, 1894-1944. In several instances reference is made to events up to the fall of 1948.

The author is Professor of Political Science at the University of California, Los Angeles, and his special field of interest is the history of public administration and governmental reform.

This important book places the momentous contributions of the League to American politics in their true perspective. In addition, it provides much invaluable information about the personalities and other influences which have helped to shape the League's work and program. The book is definitely "must" reading for all interested in the progress of local government in this country. Its publication at this time is particularly timely, in view of the fact that there are now 1,000 entries on the official list of localities operating under the council-manager plan, a form of government which the League has so successfully backed and promoted for the last forty years.

New Libraries

BUILDINGS FOR SMALL PUBLIC LIBRARIES, REMODELED AND ADAPTED, INCLUDING NEW DESIGNS FOR BRANCHES—*American Library Association, 50 E. Huron St., Chicago 11, Ill.* 1950. 39 *pp.* $1.25.

Present high construction costs have brought about a great change in library design. The plans for adapting other buildings (stores, churches, banks, etc.) as libraries or for building new ones, all take into consideration this need to secure the greatest possible floor space at the smallest cost. Most of the buildings pictured are modern in design.

National Conference of Social Work Proceedings

THE SOCIAL WELFARE FORUM, 1950—*Published for the National Conference of Social Work by Columbia University Press, New York.* 358 *pp.*

These official proceedings of the 77th annual meeting of the National Conference of Social Work, held in Atlantic City, April 23-28, 1950, include papers on physical, mental, and social well-being, social welfare and insurance, legal guardianship of children, FEPC laws, and chronic illnesses. A companion volume, SOCIAL WORK IN THE CURRENT SCENE, 1950, contains papers presented at section meetings of the 77th annual meeting of the Conference.

State Aid to Local Recreation

STATE RECREATION: ORGANIZATION AND ADMINISTRATION—*By Harold D. Meyer and Charles K. Brightbill. A. S. Barnes and Co., 101 Fifth Ave., New York 3, N. Y.* 1950. 282 *pp.* $3.50.

State assistance to political subdivisions in developing community recreation programs and services is the subject of this book, which is designed primarily for students of recreation but should be of value also to planners and state legislators. The emphasis is upon total, community-wide recreation and on the responsibility and place of state government resources in relation to it. In addition to providing the background data on why the state has a growing obligation in this field, the authors set forth the issues and problems and establish paths of procedure based on new but tested experiences. The plans and programs of North Carolina, Vermont, California, and New York receive special attention.

Zoning in Florida

MUNICIPAL ZONING: FLORIDA LAW AND PRACTICE —*By Ernest R. Bartley and William W. Boyer, Jr. Published by Public Administration Clearing Service of the University of Florida, Gainesville, Fla.* 1950. 90 *pp.*

Such subjects as delegation of the power to zone, citizen participation, the board of adjustment, nonconforming uses, procedural correctness, the doctrine of presumptive validity, injunction and mandamus, and the esthetics of zoning are covered in this report, the first of its kind in Florida.

Planning and Housing Reports

ARKANSAS—The Arkansas Tourist Industry. By Ernest C. Harvey. University of Arkansas, Institute of Science and Technology, Fayetteville. Dec. 1950. Tables. Mimeo. 31 pp.

BALTIMORE, MD.—Something Is Happening in Baltimore. Citizens Planning and Housing Assn., 319 N. Charles St., Baltimore 1. Illus. 18 pp.

BRAZIL—Programa De Melhoramentos Publicos Para A Cidade De Sao Paulo. By Robert Moses. Ibec Technical Services Corp., 30 Rockefeller Plaza, New York 20. Nov. 1950. Illus. 72 pp.

CANADA—Towards Better Communities. An address by President W. Harold Clark. Community Planning Assn. of Canada, Ottawa. Oct. 1950. 13 pp.

CHICAGO, ILL. — Housing Today: Key to Chicago's Tomorrow. Chicago Housing Authority, 606 S. Dearborn St., Chicago 5. Dec. 1950. Tables. Mimeo. 41 pp.

KALAMAZOO, MICH.—Full Employment Through Business Enterprise. The W. E. Upjohn Institute for Community Research, 709 S. Westnedge Ave., Kalamazoo. Aug. 1950. Mimeo. 24 pp.

LONDON, ENG.—Housing Centre Aims and Activities, and Housing and Town Planning Book List, 1950. The Housing Centre Trust, 13 Suffolk St., Haymarket, London SW. 1. 15 pp. Sixpence plus postage.

NEW JERSEY—Zoning. Passaic County Planning Board, County Administration Bldg., Paterson 1, N. J. Dec. 1950. Tables. Illus. Mimeo. 34 pp.

NEW LONDON, CONN.—1950 Report of the Planning Board. Alma F. Eshenfelder, President. 1 sheet, three fold.

NEW YORK, N. Y.—An Informal Report on City Planning in 1950. City Planning Commission, Department of City Planning, Municipal Bldg., New York 7. Mimeo. 16 pp.

PROVIDENCE, R. I. — Planning Is. By John E. Vance. Civic Planning and Traffic Board, Providence Chamber of Commerce, 36 Exchange Place, Providence 1, R. I. 1949. Mimeo. 10 pp. 15 cents.

SACRAMENTO, CALIF. — Sacramento Needs Redevelopment. Sacramento City Planning Commission. Oct. 1950. Tables, maps. Illus. 53 pp. $1.

UNITED STATES—The Use of School Buildings for Recreation. By H. Clifton Hutchins, of the planning staff, National Recreation Assn. *Recreation,* 315 Fourth Ave., New York 10, N. Y. Nov. 1950. Tables. 8 pp. 25 cents.

——When You Buy a Home Look at the Lot and Neighborhood. Housing and Home Finance Agency, Division of Housing Research. Available from Superintendent of Documents, Washington 25, D. C. Nov. 1950. Charts. 14 pp. 5 cents.

WASHINGTON, D. C.—Housing and Redevelopment: A Portion of the Comprehensive Plan for the National Capital and Its Environs. National Capital Park and Planning Com., Washington, D. C. Available from Superintendent of Documents, United States Government Printing Office, Washington 25, D. C. June 1950. Maps. 40 pp. 25 cents.

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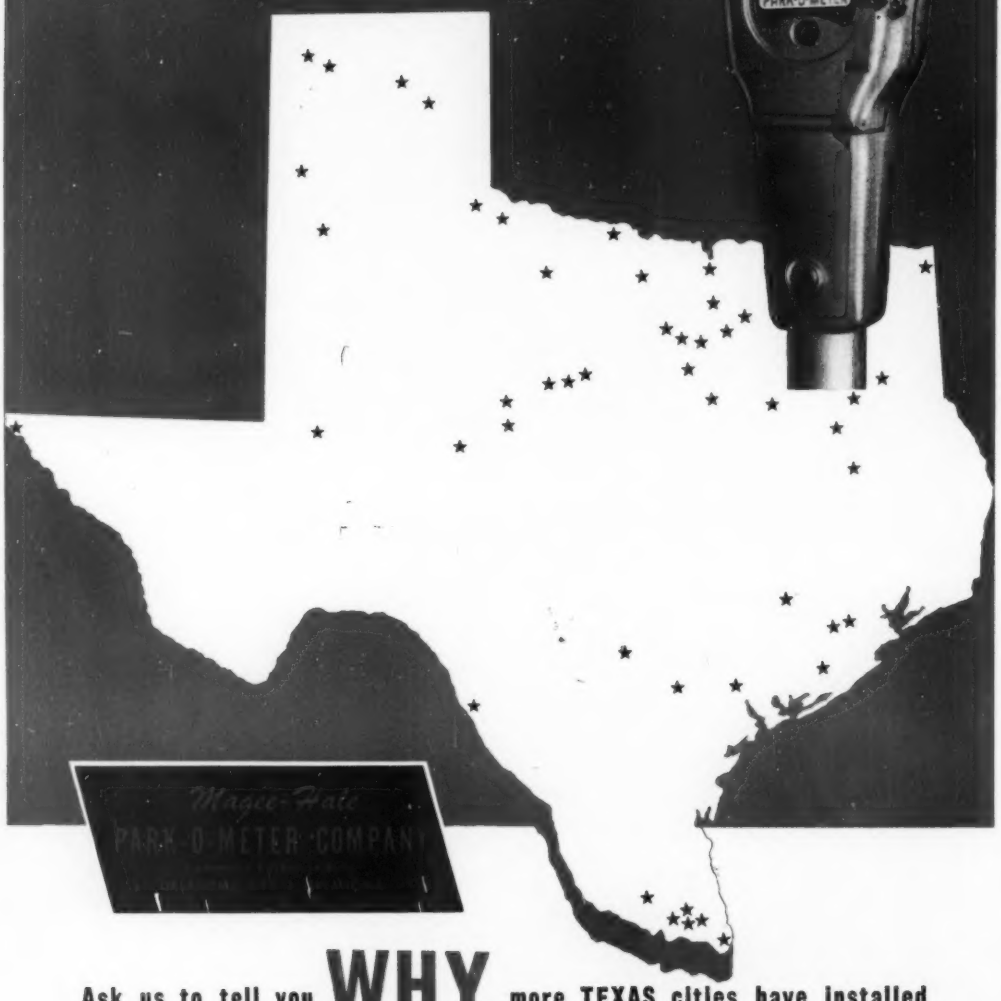

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BUFFALO, N. Y.—118th Annual Report of the City of Buffalo, 1950. Dept. of Audit and Control, Buffalo. Tables. 134 pp.

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CASTROVILLE, CALIF.—Castroville, Calif., Builds a "Straight-Eight" Sewage-Treatment Plant. By Harry N. Jenks, Consulting Sanitary Engineer, Palo Alto, Calif. March 1950. 4 pp.

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GARDEN CITY, N. Y.—Annual Report, 1950. Tables. Maps. Illus. 56 pp.

JAPAN—Five Major Cities' Views on Reallocation of Functions. (Kyoto, Osaka, Yokohama, Kobe, and Nagoya.) Municipal Administration Investigation Dept., Municipal Government Bureau, Osaka. August 1950. 16 pp.

——Report on the Survey of the Administration of the City of Osaka. Osaka Municipal Office. April 1950. Charts. 46 pp.

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MARYLAND—Adapting Hoover Commission Recommendations to a County Personnel Program. By Ben H. Hall, Personnel Assistant to County Manager and to County Personnel Board, Montgomery County, Md. Nov. 27, 1950. Mimeo. 7 pp.

——Report to the General Assembly of 1951: Proposed Bills, Vol. I. Maryland Legislative Council. Dec. 1950. 150 pp. In same volume, Final Report of the Commission on Revision of the General Corporation Laws of Maryland. Maryland Legislative Council. Dec. 1950. 92 pp.

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MONTREAL, CANADA—Annual Report of the Public Works Dept. 1950. Illus. Unpaged.

NEW JERSEY—Financial Statistics of New Jersey Municipalities. New Jersey Taxpayers Assn., 143 E. State St., Trenton 8. Sept. 1950. Tables. 42 pp.

——Proceedings of the 37th Annual Meeting of the New Jersey Mosquito Extermination Assn., New Brunswick. March 1950. Tables. 212 pp.

NEW ENGLAND—Third Annual Report, New England Interstate Water Pollution Control Com., 73 Tremont St., Boston 8. June 1950. Tables. Illus. 23 pp.

——Textile Wastes—A Review, 1936-1950. New England Interstate Water Pollution Control Com., 73 Tremont St., Boston 8. Dec. 1950. Tables. 29 pp.

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——Cooperative Study by New York State Dept. of Public Works and Bureau of Public Roads, U. S. Department of Commerce. 1950. 166 pp. Book form. Illus.

OMAHA, NEBR.—A Report on Government in 1950: Taxes and Public Expenditures of Local, State, and Federal Government in Omaha. Assn. of Omaha Taxpayers, Inc., 316 Keeline Bldg., Omaha 2. Tables. 28 pp.

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standards: concrete and metal; all parts and accessories for wood poles and metal and concrete standards.

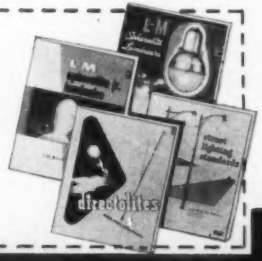
brackets and mast arms: to meet every conceivable requirement.

luminaires: for mercury vapor and incandescent; all types from the smallest Directolite for outlying areas to the largest Controlite for the brightest white way; metal or porcelain heads, for pendent or side mounting, multiple or series, low or high voltage.

complete control equipment: transformers, relays, accessories—everything you need, including a new truck-mounted service ladder.

L-M lighting engineering service: cooperates with utilities and municipalities to design and recommend efficient, economical installations.

• For complete information about L-M street lighting equipment and service, call your utility company, ask the L-M Field Engineer, or write for bulletins. Address Street Lighting Division, Line Material Company, Milwaukee 1, Wisconsin (a McGraw Electric Company Division).



34R-A

LINE MATERIAL . . . Street Lighting

Council, Washington, D. C. 1950. Tables. Charts. Illus. 619 pp.

——Highway Research Board: Soil Exploration and Mapping. Bulletin No. 28. Highway Research Board, Division of Engineering and Industrial Research, National Research Council, Washington 25, D. C. Nov. 1950. Maps. Charts. 121 pp.

——Industrial Development and Plant Location. By Victor Roterus and Sterling R. March. Business Information Service, U. S. Dept. of Commerce, Washington 25, D. C. Dec. 1950. 10 pp. 10 cents.

——The Magic Key to Hospital Literature: A Guide to the Use of the Library of the American Hospital Association. American Hospital Assn., Chicago 10, Ill. 1950. 48 pp.

——Progressive Indexing and Filing: Condensed Course for Government Offices. Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y. Illus. 71 pp.

——Tabulation of Information Relating to Street Lighting. The Street Lighting Coordination Com., Edison Electric Institute, 420 Lexington Ave., New York 17, N. Y. Nov. 1949. Tables. 16 pp. 40 cents.

VIRGINIA — Annual Report, 1950. Arlington County Dept. of Public Service. R. M. Wirt, Director, Dept. of Public Service, Court House, Arlington, Va. Tables. Charts. Unpaged.

Zoning Notes

(*Continued from page* 129)

768 square feet for a one-story house
1,000 square feet for a two-story house with an attached garage
1,200 square feet for a two-story house without an attached garage

When this provision was challenged by a subdivider who wanted to build in a Residence B district, the Lower Court granted a summary judgment that the regulation was invalid, and the Appellate Division reversed and remanded the case for trial.

The lower Court regarded the restriction as an attempt to prevent the construction of a small, inexpensive homes—partly because of the widespread desire to live in a fancy neighborhood, and partly on the theory that small homes do not pay as much in real-estate taxes as their inhabitants require in municipal services. It was estimated that the minimum cost for a conforming building would be $8,500 for a summer home, and $11,000 for a year-round house. The Court first restated the broadened test for zoning regulations developed in the *Cresskill* case.*

> This goes beyond a finding based strictly on the police power, other than general welfare, and establishes a test grounded in the community use of the land in the municipality, with due consideration to all general conditions and needs, present and reasonably to be anticipated in the region. It is, accordingly, necessary to obtain a broad perspective of the municipality and the region in which it is located.

The Court's attitude towards such requirements followed the general trend of American law in such cases.

> The provisions of the present ordinance virtually exclude from the municipality every individual who desires the privacy and other advantages of his own little home, not to mention both young and old couples who by reason of health or economic status, prefer a small servantless dwelling. In view of the fact that low-cost housing is a burning issue of the day and the dwellings erected and approved by the governmental housing agencies are themselves below the minimum-size requirement of the ordinance, the specification appears indefensible. . . .
>
> The ordinance, in its present form, practically provides that no house costing less than a certain sum may be erected in the entire community, let alone a specified area, and this it cannot legally do. . . .
>
> No person under the zoning power can legally be deprived of his right to build a house on his land merely because the cost of that house is less than the cost of his neighbor's house.

On appeal, the Appellate Division held that the question of reasonableness should be tried as an issue of fact, and so remanded the case for trial. The opinion does not make clear just what it expected in this respect. It was also held that the lower Court erred in throwing out the provision in other zones than the one at present in controversy.

While similar ordinances are occasionally defended as attempts to provide minimum living standards, and in particular to prevent the accumulation of tensions from overcrowded living—this argument would not seem to be available in this case. The distinction made between two-story buildings with and without attached garages can only be interpreted as an attempt to require houses which look rather large, thus maintaining the appearance along the street.

Minimum-building-size regulations have generally been recognized as straight snob zoning and so invalidated. While an esthetic argument can be made, it is obviously not true that larger houses are necessarily more attractive than small houses. Yet the trend of judicial disapproval has not prevented the extensive adoption of such provisions.

* *Duffcon Concrete Products v. Borough of Cresskill*, 64 Atlantic (2d) 347, discussed in THE AMERICAN CITY for December 1948, p. 149.

Rent-Control Time Limit Extended

THE amendment to the Housing and Rent Act signed by the President on December 20, 1950, extends the time limit for community action to continue federal rent control from December 31 to March 31, and validates all local-governing-council action on rent control, whether adopted by simple resolution or by ordinance, Housing Expediter Tighe E. Woods, has announced.

The amendment provides that federal control will end March 31, except in incorporated communities that act affirmatively for continuance, but the new law does not extend rent control to any community that does not now have it. Though the Housing and Rent Act of 1950 continues in effect until June 30, 1951, the law provides that rent control may end in any community before that time.

Decontrol may be effected either by a specific local resolution for removal of control or by allowing federal rule to expire March 31 without local action of any kind. To continue federal control, a community must act affirmatively before March 31 either by council resolution or by popular referendum.

More than 1,600 communities, with a population in excess of 25,000,000 and nearly 4,000,000 rental units, have not yet made a local determination to continue rent control after March 31. Nearly 850 communities, with a population of 25,000,000 and an estimated 3,700,000 rental units, have taken this action.

Want to Help in a Crisis? Here Are 12 Ways How

By EARL REICHERT
Scripps-Howard Staff Writer

UNDER the headline above, the *New York World-Telegram and Sun* presented the following suggestions in its issue of December 16:

What can the average citizen do to play his full part in this period of national emergency?

That is what thousands of Americans want to know, according to mail pouring on the White House and Congress.

President Truman did not outline a specific program for the average individual in his address last night. But top administration congressional leaders offered these suggestions:

1. Be willing to pay more taxes—a lot more.

2. Pay all the taxes you owe. Don't chisel.

3. Buy only what you need. Don't hoard.

4. Buy more government bonds out of current income so the government won't have to borrow from the banks. Government borrowing from the banks is highly inflationary. It isn't inflationary when the government borrows from individuals.

5. Cut down on expenditures for luxury items.

6. Be willing to work longer hours.

7. Put national unity above partisan or sectional interests. Don't urge government spending for some local project that can be delayed.

8. When price and wage controls come, don't ask for special treatment. Obey them.

9. Realize that we're all in this together and that the home front is a fighting front too. We must stand together with all our neighbors, with no fear, no panic, no confusion.

10. Don't try to make a profit out of war, or preparation for war.

11. Let your government—the administration and Congress — know you're ready to take whatever it is necessary to dish out, even if it means a sharply lower standard of living.

12. Insist on a pay-as-you-go program for the long-run good of yourself, your family, and your country.

On mile after mile of Chicago streets it's

AMPLEX STREET LIGHTING LAMPS!

FAR SUPERIOR LIGHTING! Dollar savings never before obtained! That's why more and more American municipalities and public utilities are adopting Amplex Street Lighting Lamps. These lamps are specially designed and built to resist the incessant shocks and jars of traffic . . . to retain the highest degree of light output during the whole of their long-burning life.

Amplex Street Lighting Lamps are made in the most complete line ever marketed . . . give you the right type and wattage for every purpose. And rapidly winning today's leadership are Amplex Weatherproof Lamps formed of "hard glass". Records prove that Weatherproofs virtually abolish failures that are caused by climatic conditions . . . establish completely new standards of dependability and service economy.

For full facts about Amplex Street Lighting Lamps and their outstanding performance, contact Amplex Corporation, Dept. K-2, 111 Water Street, Brooklyn 1, New York.

AMPLEX

Sealed-Beam Reflector Lamps, Colorbeam Lamps, Spotlites and Floodlites, Industrial Infra-Red Heat Lamps, Vibration and Rough Service Lamps, Street Lighting Lamps, Traffic Signal Lamps, Incandescent Lamps, Fluorescent Tubes, Display Accessories.

Get These Free

Write directly to the manufacturers, or use coupon on Page 23

Central Station Grinders For Garbage Disposal

175 No study of sewage and garbage disposal is complete without knowledge of the possible advantages to your system of central shredding for continuous flow. The necessary equipment has been made for 65 years by the Gruendler Crusher and Pulverizer Co., 2917-27 N. Market St., St. Louis 6, Mo.

Quiz on Diesel Engines

176 A pamphlet describing the interesting "inside" information on diesel engines used in GMC trucks is being distributed to truck operators interested in a diesel unit, according to John E. Johnson, general sales manager for the GMC Truck and Coach Division, Pontiac, Mich. The pamphlet is written in the form of an information quiz. Truck operators may obtain their copies by writing to a GMC Truck dealer.

Motorcycles Aid Control Of Increased Traffic

177 Today, traffic problems have reached an all-time peak, and city officials diligently study methods of decreasing the menace of mounting injuries and deaths. The Harley-Davidson Motor Co., Milwaukee 1, Wis., manufacturers of motorcycles and Servi-Cars, will be glad to send you information about the usefulness of this equipment in traffic problems.

Lawn Seed

178 It won't be long before you'll be thinking of how to provide attractive lawns for your city. The Albert Dickinson Co., 2764 W. 35th St., Chicago 32, Ill., will send complete information about its lawn seed for use in parks and on public grounds. The firm reports that quality seed has been blended according to formulas that have been tested and improved throughout the years.

Wide Range Chemical Feeder

179 The Omega Universal chemical feeder comes in three sizes to cover a feeding range of from 1 to 5,000 pounds per hour. A highly accurate machine, the Omega is strong but simple and readily adaptable to varied needs. It features automatic proportionate control, large retention-type dissolving chamber, extra hopper capacity, and hydraulic jet mixer. Write for descriptive folder to The Omega Machine Co., Div. of Builders Iron Foundry, Providence 1, R. I.

Rugged Mower

180 The big, easy-to-handle Yazoo Master Mower is a light-running, economical, sturdy, and efficient mower that can handle tough weeds as easily as grass, claims the Yazoo Mfg. Co. It takes steep grades without struggle or strain, cuts close, features powerful gasoline engine, rugged steel housing, and a double spring-steel blade. An illustrated folder with full details on four models is available on request from the Yazoo Mfg. Co., Jackson, Miss.

This Machine Lays Pipe Without Trenching

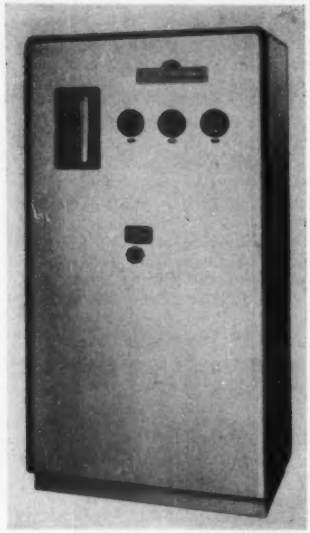
181 The Giant Mfg. Co., Dept. P, Council Bluffs, Iowa, will send a free booklet telling how you can save up to 80% with its small tool that pushes pipe up to 15-inch diameter through the ground, under the frost line, at the rate of one to five feet per minute.

Flame-Proofed Canvas

182 The Philadelphia Textile Finishers, Inc., Norristown, Pa., on request will send a special bulletin describing the use of Flamefoil which reduces fire hazards. The firm reports that its fabric, approved by fire prevention authorities, can be used for awnings, tents, canopies, and other canvas equipment. Flamefoil will not burn beyond the immediate affected area, even when it is in direct contact with flame. This fabric is also resistant to water, weather, and mildew.

News and Illustrations

Items of interest to city, town and county officials and others concerned with the economical construction and efficient operation of public improvement undertakings



This new high-capacity chlorinizer has feeding rates of from 100 to 6,000 pounds per 24 hours.

High-Capacity Chlorinizer

Builders-Providence, Inc., 358 Harris Ave., Providence 1, R. I., will send information on its new high-capacity chlorinizer with feeding rates of from 100 to 6,000 pounds per 24 hours. This high capacity unit has the visible gas flow feature which is standard on the line of equipment, the firm reports.

To the basic HCVS manual chlorinizer may be added Builders step control, automatic proportioning, semi-automatic or programmed control with no modification of the basic manual unit. The full feeding range of each unit is available with no change in the functional parts.

Builders-Providence says that this new chlorinizer can be used in domestic and industrial water treatment employing any type of chlorination practice and at any point of application desired. It can also be employed in sewage and industrial waste treatment at any location and for any purpose of treatment.

Oak Ridge Is Air-Mapped

Oak Ridge, Tenn., a community at the site of one of the nation's major atomic energy developments, is being air-mapped by the Abrams Aerial Survey Corp., of Lansing, Mich., it has been announced by W. S. Karr, vice-president of the concern.

The Abrams Corp. is cooperating with Michael Baker, Jr., Inc., a Rochester, Pa., engineering firm, in the performance of this property survey for the United States Atomic Energy Commission.

While security regulations preclude a detailed account of the operation, company officials state low-altitude mapping techniques are being employed.

The survey crew, flying a twin-motored Beechcraft AT-11 mapping airplane, is using McGhee-Tyson Airport, Knoxville, Tenn., as a base for its photographic operations.

The Abrams firm recently completed the air-mapping of Richland, Wash., a part of the Hanford atomic energy project.

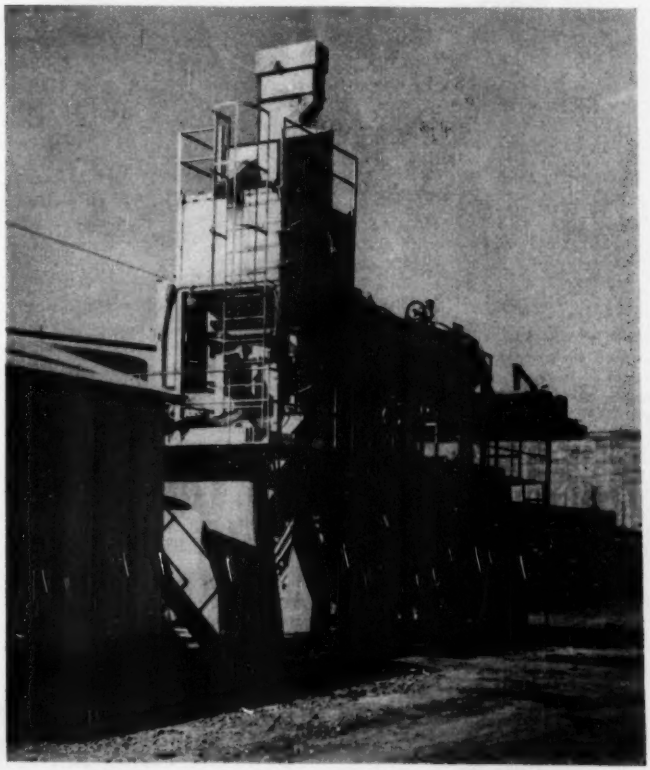
City-Owned Asphalt Plant

Just as hot-mix gives the best service on city streets of any asphalt surfacing, so the White Model L-12 has been designed to produce high quality asphalt plant mix.

The White Models L-12 and L-25 consist of a dryer, burner, mixer, kettle, measuring apparatus, and other appurtenances. The dryer is 46 inches in diameter and 15 feet long in the smaller model, 20 feet long in the larger. Rotating central cross flights increase the dryer efficiency. It receives heat by a low-pressure burner that can use either light diesel or furnace oil. The pug mixer is of the batch type. On the small model is a single axle, on the larger, twin axles.

Measuring apparatus is on a volumetric basis, although weight scales can be provided. Elevators and controls are built ruggedly and located conveniently. The entire plant is on a single, welded frame.

The plant is described in detail in Catalog No. 32-D, recently published by the White Mfg. Co., Elkhart, Ind.



This is the plant that Lincoln, Nebr., selected to meet its paving needs.

L-69 FLOODLIGHT

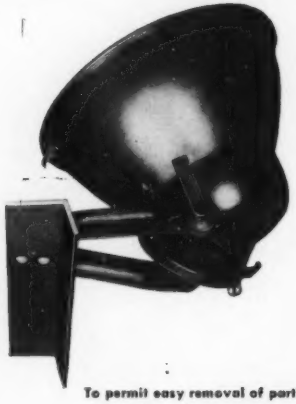
For lighting sports fields and recreation areas General Electric's universally accepted Type L-69 floodlight is your best bet. To improve your sports lighting, consider the simplified installation and maintenance and more light per watt featured by this light.

Heavy-duty service at lightest weight is yours with L-69's. Remember, they have simple one-bolt mounting, convenient beam-sight aiming . . . don't require any tools for initial positioning and maintenance . . . have favorite hand-toggle latches. The spun-on, impact resisting tempered plate glass won't break if struck by ball, keeps water, dirt, and insects out permanently.

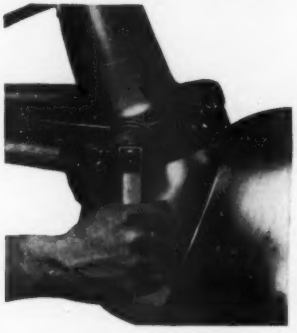
For your convenience, Floodlighting Plans for Sports and Recreation are available. Get them from the lighting specialist in the nearest G-E Sales Office, or write to *Apparatus Department, General Electric Company, Schenectady 5, New York.*

NOW GET THESE 5 FLOODLIGHT FEATURES

To put the right light in the right place, and to save installation time, the G-E Type L-69 floodlight can be aimed precisely—during the daytime—with the convenient beam sight.



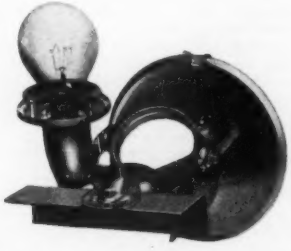
To permit easy removal of particles in case of lamp breakage, the reflector tips over completely. No tools required.



Exclusive L-69 features save time and effort in adjusting and servicing the light. Built-in wrench-type handle eliminates need for tools. Double clamping action holds against vibrations.

Relamping and cleaning is easy. Just flick hand toggle latches, clamp socket housing to trunnion bracket. Hands are free to service light, and reflector need not be disturbed for cleaning.

For many installations, floodlight can be aimed while the pole is on the ground with the aid of easy-to-read horizontal and vertical degree scales.



GENERAL ELECTRIC

451-160

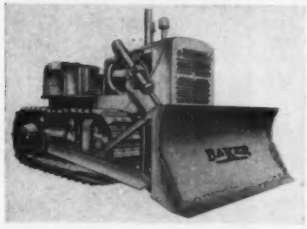
Leak Clamps for Pipe Lines

Made of pearlitic cast iron, Carson clamps are employed to stop joint leakage on old pipe lines conveying either water, gas, or oil. The manufacturer, the Carson-Cadillac Co., Birmingham, Ala., furnishes this equipment in sizes from 3 to 36 inches.

The specially designed enclosed bolts grip the pipe bell. The firm says that the gasket and gland and cast iron bolts become an integral and permanent part of the cast iron pipe, giving flexibility without leaks, interrupted service, and saving in repair cost.

Carson clamps are adjustable to fit variations in bell face and variations in circumference of either the bell or the spigot of a pipe joint. Upon request, the firm will send literature about its leak clamps and its C-60 pearlite cast iron bolts.

Tractor Has Three New Heavy-Duty Attachments

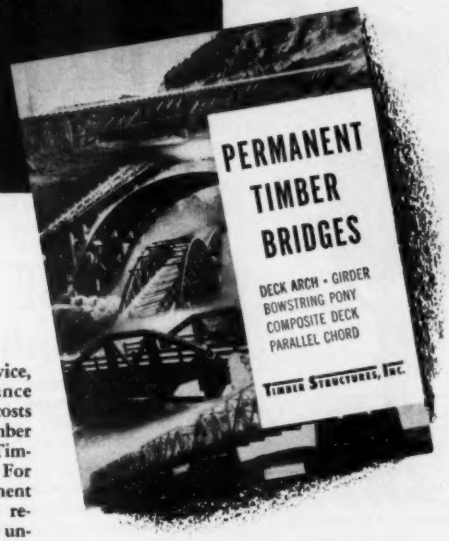


Three new heavy-duty attachments, designed to enhance the versatility of the new and more powerful Allis-Chalmers HD-20 tractor, has been announced by The Baker Mfg. Co., Springfield, Ill. Specifically built to work with the HD-20, the new Baker bulldozers, gradebuilders and root rippers are available in both hydraulic and cable-controlled models.

Baker reports that the outstanding design feature of the attachments is the fingertip control achieved through the short linkage between the blade control lever and hydraulic control valve. The reduced number of working and wearing parts in the short hydraulic linkage enables the operator to feel the changes in blade position and maintain full positive control with greater ease.

Complete specifications on all Baker attachments are available from Baker-Allis-Chalmers dealers or direct from The Baker Mfg. Co.

The way to Low Bridge Costs... with permanent bridges of engineered timbers



You get years of service, minimum maintenance and genuinely low costs when you install a timber bridge fabricated by Timber Structures, Inc. For truly these are permanent bridges, designed to remain fully serviceable until after changing traffic conditions have made the site obsolete.

Glued Laminated Members for Dimensional Stability

Primary structural members of Timber Structures bridges are glued laminated timbers, formed of select kiln dried Douglas fir, joined under pressure by permanently waterproof glues stronger than the wood itself. Thus literally "shop grown" to the exact specifications of the designer, these members are not subject to dimensional changes and seasoning action.

Before shipment and erection these members are given an approved preservative treatment for lasting protection against damage by weather and insects. All stressed connections are made with ring connectors or shear plates, assuring maximum strength and durability.

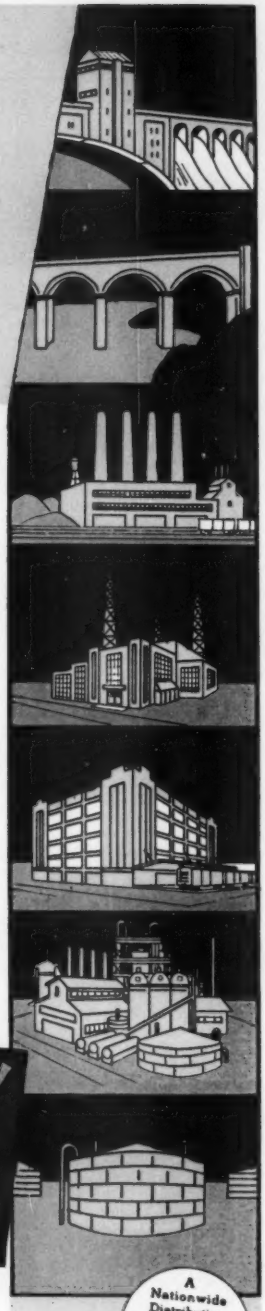
Ask for Literature on Timber Bridges

An illustrated folder has just been published showing the five basic bridge types of Timber Structures, Inc. — deck arch, bowstring truss, parallel chord truss, composite deck and girder. Typical applications are shown, together with detail drawings of each type. A copy of this folder is yours for the asking. Get it from your nearest Timber Structures representative, or fill in and mail coupon.

TIMBER STRUCTURES, INC.
P. O. BOX 3782-X, PORTLAND 8, OREGON
Offices in New York; Chicago; Kansas City, Missouri; Dallas, Texas; Eugene, Oregon; Seattle and Spokane, Washington.
Timber Structures, Inc., of California, Oakland, Calif.
Timber Structures of Canada, Ltd., Peterborough, Ont.
Local Representatives Coast to Coast

TIMBER STRUCTURES, INC.
P. O. Box 3782-X, Portland 8, Oregon
Please send folder on Engineered Timber Bridges to
Name_____
Company_____
Address_____ Zone____
City_____ State____

Light! ... for PROTECTION



Type DCX-18 Searchlight

Type ADE-14 Floodlight

Type LCE-1120 Floodlight

America is faced with the ever-present danger of sabotage that would cripple vital services and production facilities. Sabotage thrives in darkness. The most reliable and cheapest form of protection against night prowlers is LIGHT!

CROUSE-HINDS Floodlights

project powerful beams of light that bathe all approaches to your property with glaring radiance, killing darkness and shadows and compelling everyone to be more visible at night than in broad daylight.

The protective power of light should be used in all important municipal and industrial locations, including waterworks, dams, pumping stations, gas works and gas storage tanks, electric power plants and substations, factories, mills, mines, bridges, docks, warehouses, railway terminals, tunnels, shops and freight houses, canal locks, and aqueducts, oil refineries, pump houses and storage tanks, telephone and telegraph stations, radio stations.

The floodlighting of industrial plants serves a double purpose. It helps to boost production in addition to the security it provides.

Crouse-Hinds offers a complete line of floodlights and searchlights that will meet the needs of any type of protective lighting. Crouse-Hinds illumination engineers have a wealth of protective lighting knowledge that is at your service. Send for your copy of Bulletin 2565, "LIGHT! Protect Your Property."

CROUSE-HINDS COMPANY
Syracuse 1, N. Y.

Offices: Birmingham — Boston — Buffalo — Chicago — Cincinnati — Cleveland — Dallas
Denver — Detroit — Houston — Indianapolis — Kansas City — Los Angeles — Milwaukee
Minneapolis — New York — Philadelphia — Pittsburgh — Portland, Ore. — Salt Lake City
San Francisco — Seattle — St. Louis — Washington. Resident Representatives: Albany
Atlanta — Baltimore — Charlotte — New Orleans — Richmond, Va.
CROUSE-HINDS COMPANY OF CANADA, LTD., TORONTO ONT.

A Nationwide Distribution Through Electrical Wholesalers

FLOODLIGHTS • AIRPORT LIGHTING • TRAFFIC SIGNALS • CONDULETS

Dual parking meters are used in this lot in Wichita Falls, Texas.

First Metered Municipal Parking Lot in Texas?

On November 10, 1950, in Wichita Falls, Texas, City Manager Frank Wood opened a 45-car municipal metered parking lot that is claimed to be the first of the kind in Texas. As the city has a parking problem at night in addition to the usual day-time problem, the lot operates from 8 a.m. to 12 midnight. There is no charge from midnight to 8 a.m., yet the lot is practically patrolled by police to protect the cars of overnight parkers.

Dual parking meters are used and the customer is allowed two hours for a nickel; the meters taking up to six nickels or 10 hours for one quarter.

Public acceptance has been excellent and revenues above expectations; the lot filling shortly after 8 a.m. and staying full.

While this small lot falls far short of a complete solution to the parking problem of a city of over 40,000 population, it is a material help and the enthusiastic acceptance by the public leads us to believe that additional lots of this nature are a must in the near future to relieve our parking problem.

L. M. Crow, Jr.
Asst. City Manager
Wichita Falls, Texas

C.I.M.A. Advisory Group

General William H. Harrison, Administrator of the National Production Authority, reports the appointment of an over-all Construction Machinery Industry Advisory Committee to serve the Construction Industry Manufacturers Association, 135 S. LaSalle St., Chicago 3, Ill.

The men are: W. B. Greene of Barber-Greene, bituminous equipment; Kenneth Lindsay of Iowa, crushing equipment; J. R. Steelman, Koehring, concrete equipment; F. Salditt of Harnischfeger, cranes, shovels, and excavators; P. H. Birckhead of Bucyrus-Erie, drills, and G. A. Gilbertson of Hough, loaders.

Also, Ralph K. Stiles, Austin-Western, motor graders; Ray McLean, Jaeger, contractors pumps; M. D. Shaffer, Buffalo-Springfield, rollers and compactors; R. E. McCluskey, LeTourneau, hauling scrapers; Gail E. Spain of Caterpillar, tractors, and E. B. Hill, Gar Wood, tractor allied equipment.

Others include: E. F. Armington of Euclid, trucks and trailers-off-highway hauling equipment; O. J. Neslage of Joy, portable air compressors; S. R. Ives, Armco. miscellaneous equipment, and Ray Arnold of Arnold Machinery, construction machinery distributor.

LOW-COST WATER from Caisson Wells

Caisson Wells yield large capacities of low-cost water. Well fields 10 to 150 feet deep are tapped economically, especially when in contact with a surface water body. Lifelong installation — requires practically no maintenance.

Write for information

CAISSON WELLS, INC.
Ground Water Engineers and and Contractors
33 W. 42nd St., New York 18, N. Y.

TARCO
can carriers

No. 17-S

"Street Sweeper's Friend"

Single-piece welded frame. Choice of tiring: pneumatic, solid rubber, plain steel. Roller bearings. Full swiveling caster wheels. Silent can clamp. Safety warning flag. Balanced and light running.

TARCO welded carriers are STRONG.

TARRANT MFG., CO.
East Ave., Saratoga Springs, N. Y.

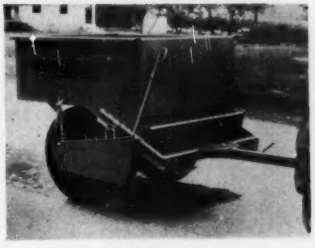
SWENSON SIDEWALK SAND SPREADER

A new fast way to cover icy walks and drives with sand, ashes, cinders, salt, etc.

Hopper capacity, 1 yard.

Write for detailed information

SWENSON SPREADER & MFG. CO.
LINDENWOOD, ILLINOIS



Here's the Most Revolutionary Highway Invention Since the "WHITE" Line!

Modernize Your Antiquated Road-Marking Equipment in Just 10 Minutes!

VACU-LINER *

An entirely new superbly engineered instrument for use with standard road-marking equipment . . .

- Pays for itself in the very first few days of operation!
- Assures precise highway marking under all conditions!

VACU-LINER . . . a corrosion-resistant, electro-coated, seamless high grade metal alloy instrument which assures straighter lines through better vision, equal distribution of paint from edge to edge, sharper edges on curved lines, in lettering, etc. No contact with the ground—no fire hazard due to static sparks—no wear. *VACU-LINER does away with replacements of attachments!*

VACU-LINER eliminates

- Jagged edges
- Edge build-up
- End-of-Line dribble
- Prolonged clean-up
- Does away with shields, discs, air jet assemblies!

VACU-LINER now being used with perfect results with hand-gun, one, two and three-gun power equipment in cities, counties, states throughout the nation!

*Protected by Patents Pending

SOLD ON UNCONDITIONAL MONEY-BACK GUARANTEE

An Exclusive Product and Available Only From

HUNT PROCESS COMPANY
7012 STANFORD AVENUE
LOS ANGELES 1, CALIFORNIA

MAIL THIS HANDY COUPON TODAY

Hunt Process Co.
7012 Stanford Avenue
Los Angeles 1, California

Gentlemen:

We want.....VACU-LINERS @ $18.75 each for.....type guns.

We want.....VACU-LINERS @ $18.75 each for.....type guns.
(Designate type of gun for correct bracket.)

We understand that VACU-LINERS are sold only on an Unconditional Money-Back Guarantee. RUSH OUR ORDER—POSTPAID—and complete instructions to:

PURCHASE ORDER #_____ DEPT._____

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

Newly blasted rock salt is carried by truck along roads of salt 1,137 feet beneath Detroit, Mich., in the mine of the International Salt Co., Inc.

Salt City Beneath Detroit

Eleven hundred feet under one of Detroit's most thickly populated districts lies a city of salt, where automobiles travel on white salt streets, and traffic is regulated by stop signs and lights at subterranean road intersections.

This city beneath a city, the Detroit mine of the International Salt Co., Inc., Scranton, Pa., has been growing steadily since the first mining operations were begun there 44 years ago. Today, as the result of a program of improvements started in 1941, it represents one of the most modern and efficient mining operations in the world, and covers an area of approximately 300 acres stretching in a southwesterly direction from Fort Street and Sanders Avenue, Detroit.

The new operation utilizes about two miles of conveyor belts to carry rock salt from the working faces of the mine to a series of crushers, where the rock salt is crushed and graded to four commercial sizes. From the final crusher, it is carried to storage areas or directly to the hoisting skips, which lift it to the surface for storage or shipment.

Today, about half the salt produced and sold in the United States is rock salt; a large portion of it comes from the International Salt Co.'s Detroit mine, its Retsof mine near Rochester, N. Y., and its Avery Island, La., mine.

The company, which developed from the Retsof Mining Co., founded in 1884 by William Foster, Jr., was organized in 1901 as the International Salt Co., which today produces 69 different types of salt for use in industry, on the farms, and in the homes.

John Littleford Dies

John Spencer Littleford, founder of Littleford Brothers, Inc., manufacturers of steel tank and road equipment, and father of the Company's president and vice-president, Roger S. Littleford and John S. Littleford, Jr., respectively, died November 12 at the age of 94.

Mr. Littleford started his career as an associate of a small sheet-metal products company established by his grandfather at 500 E. Pearl St., Cincinnati, Ohio, site of the present main offices of Littleford Brothers, Inc. He and a brother, Thomas S. Littleford, purchased the entire business in 1892.

He held posts in Casey-Hedges Boiler Co., Chattanooga, Tenn., and Continental Portland Cement Co., St. Louis.

Save money
ON STREET SWEEPING
with
MOBIL-SWEEPER

Sweep your streets cleaner at less cost with dependable Mobil-Sweeper. Its large dirt hopper and special gutter broom design do a better job faster. It's the safest motor sweeper built. Sweeps all pavement even on steep hills. Let Mobil-Sweeper help balance your budget. Write on your letterhead for illustrated catalog.

Dealers in principal cities.

MOBIL-SWEEPER
DIVISION OF
THE CONVEYOR CO.
3260 E. SLAUSON AVENUE
LOS ANGELES 58, CALIF.

EMBURY

Protection Plus!

EMBURY
Luck-E-Lite
HIGHWAY TORCHES

* Weather Guard Burner
* Cam-lock Burner Hood—no threads to strip
* Easy to Fill
* LUCK-E-LITE Ring Chain—easy to carry and place.
* Non-tipping

For More LUCK-E-LITE Facts, Write
EMBURY MANUFACTURING CO.
WARSAW • NEW YORK

EMBURY

Versatility and Power make this HUBER a Real Maintainer!

Look at its versatility! Hydraulically controlled attachments quickly and easily convert it to bulldozer, lift loader, highway mower, berm grader, broom, road planer, patch roller or snow plow service.

Look at its power! . . . . 42½ H. P.

Other important advantages: 1—The blade is PUSHED by Huber's exclusive modified A-frame design. Power is transmitted to the moldboard DIRECTLY from the driving wheels. The result: better traction, less power loss and more efficient use of the machine's 6000-pound weight.

2—The HUBER Maintainer gives you maximum work results and versatility in a single, one-man machine at modest investment and operating costs.

Get more for your maintenance dollars—your nearest HUBER Distributor will show you how.

HUBER

SINCE 1863

HUBER

MANUFACTURING COMPANY • MARION, OHIO, U. S. A.

MANUFACTURERS OF HUBER MAINTAINERS, GRADERS AND COMPLETE LINE OF ROLLERS

Sales, Advertising Director

Oliver A. DeCelle has been appointed director of sales and advertising, of the B. F. Gump Co., 1325 S. Cicero Ave., Chicago 50, Ill., manufacturer of chemical feeders, weighers, grinding and packaging equipment.

Starting his career as a design engineer, Mr. DeCelle had been with Infilco, Inc., since 1914, serving as sales engineer, New York district manager, advertising and sales manager, and was executive vice-president at the time of his resignation when Infilco moved from Chicago to Tucson, Ariz.

New Light-Weight Paving Breaker

A light-weight 50-pound paving breaker with the power of many heavier breakers is the newest addition to the line of Cleco pneumatic tools. The manufacturer reports that the RC-50 is light enough to be handled by one man in horizontal or overhead work, making it adaptable to a wide range of uses. It is especially suitable for brick work, asphalt-cutting, and shop maintenance work.

This machine has the same type of Reed-Cleco valve as that used on the heavier paving breaker, the RC-80.

Full information may be obtained by asking for Bulletin RC-949, Cleco Div., of the Reed Roller Bit Co., 5125 Clinton Drive, Houston 20, Tex.

This light-weight paving breaker has a wide range of uses.

GET ORDERS IN NOW
for low-cost Bantam

Saves on garbage disposal

Many cities report substantial savings in disposal costs with Bantam sanitary land-fill method. Mobile Bantam hoe or dragline opens suitable trench in a few hours . . . returns as needed to spread and compact fill over refuse.

Speeds sewer repairs

Truck-mounted Bantam easily handles 3 to 4 sewer or water line repairs per day, including breaking 20' to 30' lengths of pavement and digging down 10' to 12' to make the repair. Sewer Supts. report savings up to 75% over hand methods.

Cuts cost of materials handling

Versatile Bantam goes anywhere, anytime at speeds to 35 M.P.H. . . . keeps busy stock-piling sand, cinders, aggregate . . . loads trucks, hoppers, etc. . . . pours concrete . . . handles steel, pipe, slabs, etc. . . . has 6 fast-change attachments for year 'round use.

Clip... Mail today!

SCHIELD BANTAM CO., 234 Park St., Waverly, Iowa SB-MU-2

Send details on truck-mounted Bantam ☐ Shovel ($6195)* ☐ Pile Driver ($6110)* ☐ Dragline ($5940)* ☐ Hoe ($6040)* ☐ Crane ($5520)* ☐ Clamshell ($6080)*

Title

Name

Company

Address

City State

Less truck, F.O.B. Waverly, Iowa. Prices subject to change without notice.

SCHIELD BANTAM

Costs less . . . goes anywhere fast

GETS MORE JOBS DONE

formed under vacuum for greater strength

Vitrified CLAY PIPE

DE-AIRING — a process that makes Clay Pipe *stronger* for greater load-bearing, *denser* for less absorption, and dimensionally *truer* for faster installation — takes place in a vacuum press as the pipe is precision-formed under pressures as high as 75 tons.

De-airing, like the exclusive Vitrification process, is an outstanding example of technology at work for you . . . bringing you *better* Clay Pipe — stronger, denser, truer lengths for every sewerage and drainage use. Industry-wide research is constantly improving the traditionally high quality of Vitrified Clay Pipe — and developing new test procedures to *insure* consistent standards.

Vitrified Clay Pipe requires no "extras" . . . no special coatings to protect it from deterioration. It is corrosion-proof *throughout* — completely immune to destructive chemicals in soil, sewage, or industrial waste. You can specify it *safely*, with complete assurance that Clay Pipe *never wears out.*

NATIONAL CLAY PIPE MANUFACTURERS, INC.
100 N. LaSalle St., Rm. 2100, Chicago 2, Ill.
206 Connally Bldg., Atlanta 3, Ga.
703 Ninth & Hill Bldg., Los Angeles 15, Calif.
311 High Long Bldg., 5 E. Long St., Columbus 15, Ohio

SPECIFY *Vitrified* CLAY PIPE

WRITE FOR DETAILED INFORMATION

Additional information and data on Vitrified Clay Pipe, Wall Coping and Clay Flue Lining sent FREE on request. State your specific questions. Simply contact the regional office nearest you.

C-151-9

Merry-go-round of Airplanes Appeals to Little Children

The Pedal Plane Mfg. Co., S. Beloit, Ill., reports the manufacture of a new and novel pedal plane ride which combines all the fun of a merry-go-round and the universal appeal of airplanes, without the cost of a motor or the expense of fuel.

Children say: "It pedals like a bicycle and flies like a bird."

In motion, the planes swing out eight feet on ball-bearing hinged support shafts to give 24 youngsters a thrilling, yet perfectly safe action ride. Motive power is supplied by the plane riders. Besides six planes for individual riders, the unit features two passenger cars, each of which provides free rides for nine children or six adults.

Each plane is equipped with a safety-brake plus an originally designed safety seat that can accommodate children or adults. Competely safe operation is assured, since drive chains, shafts, bearings, and gears are entirely closed.

The easy-to-maintain unit revolves on one Timkin taper bearing. Sturdily constructed for hard playground use, Pedal Plane Ride will withstand a 200% overload. Over-all diameter is 24 feet and flying diameter, 32 feet.

Complete information about the Pedal Plane Ride may be obtained by writing to the Pedal Plane Mfg. Co., South Beloit, Ill.

They "fly through the air with the greatest of ease. . . ." Youngsters thrill to the Pedal Plane Ride which combines the fun of a merry-go-round and the universal appeal of airplanes.

Light-Weight Truck Mixer

A new light-weight standard truck mixer, reported by its manufacturer to be the lightest available anywhere, has been announced by the Blaw-Knox Div. of the Blaw-Knox Co., 2009 Farmers Bank Bldg., Pittsburgh 22, Pa. Called the Hi-Boy Trukmixer, the new device boasts improved performance and easy accessibility.

The Trukmixer, whose weight in the three-cubic yard model, has been reduced by a full ton, nevertheless retains the ruggedness required in mixer construction. Some of its weight-reducing features include a new three-way piston-type water valve that greatly simplifies its piping system, compact and simplified modern-design transmission, and a new double-strand roller chain drive which makes for automatic compensation when rough-road operation causes misalignment between drum and drive.

BASIC *for Civilian Defense!*

APPROVED FIRST AID EQUIPMENT FOR MUNICIPALITIES

We are the originators of the latest adopted design of military litters. This litter or stretcher is similar in design, but is especially constructed of non-critical materials to meet civilian demands. Inexpensive, yet equally sturdy.
Suppliers to the government of Thomas Arm and Leg Splints and accessories and the Conn Pneumatic Tourniquet, as illustrated above. Suppliers of medical bandages, dressings, and adhesive tape.

Write for information and quantity discounts. State your requirements.

AMBULATORY SPLINT CO. 392 Second Ave. New York 10, N.Y.

MARK-TIME MANUAL PARKING METERS

FIRST

IN TRAFFIC CONTROL *and* EARNING POWER

A parking meter is designed to control traffic. How well it does the job depends upon its ability to remain in continuous operation, month after month, year after year, through every kind of weather and condition of service. That's why the Mark-Time Manual "Hurricane" Parking Meter is FIRST in traffic control. The simple, rugged, Mark-Time construction means fool-proof, foul-proof performance without costly "time-out" in the repair shop.

Scores of cities have found by test and by experience that Mark-Time "Hurricane" Parking Meters cost less to maintain . . . *by far*, give greater service . . . *by far* . . . and are more popular with the parking public . . . *by far!*

A Mark-Time installation on the streets of your city is assurance of continuous, dependable operation, and is therefore a far better revenue producer over the years. Your best investment *by far* is the Mark-Time "Hurricane" Parking Meter.

Manufactured and sold in Canada by Ontario Hughes Owens Co. Ltd., of Ottawa, Ontario

MARK-TIME

M. H. RHODES, INC. HARTFORD, CONN.

More miles of road at lowest cost per mile makes this husky Model 501 the decided choice of contractors and public bodies, who have taken the time to check up and compare.

It will be your decision too, for this No. 501 gives you tremendous ground gripping traction on its huge 18:00x26 tires, tremendous blade pressure for tough going, plenty of weight on front and rear, plenty of over-all weight for rugged strength and long life.

It has all the important basic features of the highest price machine, yet none of the seldom used extras which add to the original cost of a grader. It will handle rough grading, fine grading, maintaining and ditching — and do the job to anyone's satisfaction, at the lowest obtainable cost.

Before you invest in any grader it will pay you to investigate the M-B line, and the various attachments which make it an all around, year around performer. Send for literature today!

traction

Huge, low pressure, 10 ply 18:00 x 26 tires provide 613.6 square inches of ground contact.

weight

17,180 lbs. of rugged strength. Heavy front (4,970 lbs.) and rear (12,120 lbs.) provide stability and traction under all conditions.

blade pressure

8,040 lbs. of pressure on the blade produces full loads and positive action in tough going.

power

51 H.P. Gasoline or Diesel, heavy duty engines that are built for road work. Simple, trouble-free, economical.

MEILI-BLUMBERG CORPORATION

1635 WISCONSIN STREET • NEW HOLSTEIN, WISCONSIN

MAINTAINERS

STREET AND HIGHWAY MARKERS

TRAILERS

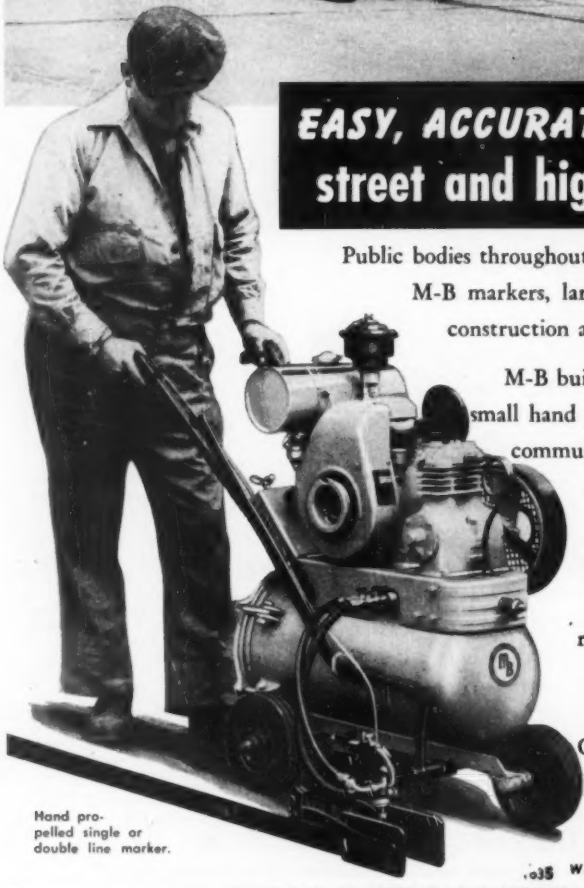
SUPER 10
Self-propelled, one man operated traffic marker. Lays single, double or triple lines — solid or intermittent — one or two colors and beaded paint.

EASY, ACCURATE, ECONOMICAL street and highway STRIPING

Public bodies throughout the world are standardizing on M-B markers, largely because they are superior in design, construction and performance.

M-B builds a complete line of markers from a small hand propelled model which is ideal for small communities to the big super 10, the last word in highway markers.

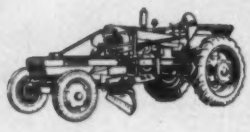
Each model lays a penetrating coat of paint quickly and accurately, is versatile enough to handle all of your requirements, and possesses exclusive, advanced features that meet the most rigid spcifications. Get complete details and prices today.



Hand propelled single or double line marker.

MEILI-BLUMBERG CORPORATION

.035 WISCONSIN STREET • NEW HOLSTEIN, WISCONSIN



MAINTAINERS

STREET AND HIGHWAY MARKERS

TRAILERS

New Sales Executives

Stuart E. Yeaton, general product manager of the Electrical Wire Division of the John A. Roebling's Sons Co., Trenton, N. J., reports the appointment of three new sales executives.

Howard L. Maloney was named manager of sales; Frank T. Craven, assistant manager of sales, and Roy H. Hainsworth, as eastern regional manager.

H. E. Maloney

Mr. Maloney joined the firm nine years ago as a salesman in the Seattle district office. Until recently, he was assistant manager of the division's main sales office in Trenton.

Long-Lasting Portable Blinker Light

The evolution of a new type of circuit interrupter, developed by Light Products, Inc., 407C Commercial Center, Beverly Hills, Calif., has made possible a warning light suitable for trucks or passenger cars used by municipalities. The light will run on a single small six-volt battery for 1,200 hours.

Called the "Neo-Flasher," this light is reported to be weather-proof, vapor-proof, shock resistant, lightweight, and produces a brilliant, sharp red flash at ½-second intervals. The manufacturer reports an operating cost of approximately one cent per night.

The Neo-Flasher is constructed of sheet steel. The six-volt dry cell battery, designed specifically for Light Products, Inc., furnishes power to light the neon tube which is the source of light. To prevent theft, specially constructed clips are available so that the light may be locked onto a truck, barricade, or any other object. Clearly visible for 2,500 feet, the light is available in two models.

Huber's N. Y. Distributor

The Huber Mfg. Co. of Marion, Ohio, has announced the appointment of Hodge and Hammond, Inc., as distributor for the New York metropolitan area and Long Island.

L. J. Hammond is president of the firm, and G. W. Lochner, vice-president.

Hodge and Hammond, Inc., has offices at 1162 Grinnell Place, New York 59, N. Y. The new representatives will handle the complete line of Huber road-building and maintenance equipment, including the Huber maintainer, heavy-duty motor grader, and tandem and three-wheel rollers.

Clermont Covert Dies

Clermont C. Covert, who was associated with W. & L. E. Gurley for 28 years, died suddenly on Dec. 11 in Binghamton, N. Y. Born in Townsendville, N. Y. on January 25, 1872, he received his civil engineering degree from Ohio Northern University.

Before becoming a hydraulic engineer for Gurley in 1926, Mr. Covert served as junior engineer for the United States Geological Survey and later was district engineer with the Water Resources Branch of the Survey's Albany office.

Mr. Covert was manager of Gurley's New York office from 1926 until its closing in 1948. The company, located at 510 Fulton St., Troy, N. Y., manufactures surveying and engineering instruments.

The

SEWER SCOOTER*

*Trademark

Sewers Clean Themselves With a Sewer Scooter

100% self-propelled for 6" to 96" sewers —is equally effective for all conditions and problems of sewer maintenance — completely cleans sewers of all sediments: rocks, gravel, sand and "hard-to-move" sludge.

Quick and efficient in operation. Investigate today! Ask for Bulletin.

Dealers—Some good territory open

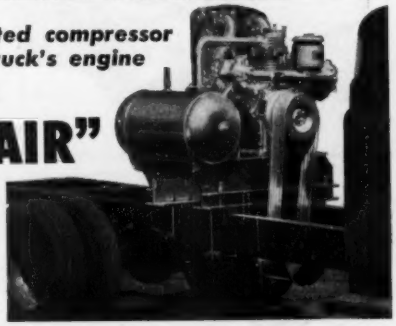
Fitzgerald Engineering Co., Inc.

P. O. Box 289-G, Coral Gables 34, Fla.

Now, a truck-mounted compressor powered by your truck's engine

Jaeger

"TRAVEL-AIR"



For big savings in first cost, half the maintenance cost, and remarkable operating advantages.

Furnishes 125 cfm at 100 pounds pressure.

Travel-Air Compressor units are easily adapted to your own truck body designs. For five makes of 1½ and 2-ton rated trucks.

The famous heavy-duty Jaeger Compressor, arranged to mount on your service truck and get its power from the truck engine! A simple, rugged power-takeoff does the trick. Savings are immediate and continuing. No compressor engine, clutch, battery, trailer unit, tires, etc. to buy *or maintain*. No compressor engine cooling system to guard. No warming up after crews reach the job — and, crews, compressor, tools and materials get there at the same time. You utilize an engine that usually stands idle 7 out of 8 hours. There are more advantages — write for Bulletin TC-1, or see your Jaeger distributor.

Other Jaeger Compressors — **Portable and Stationary — 56 to 600 cfm.**

THE JAEGER MACHINE COMPANY

505 Dublin Ave., Columbus 16, Ohio • Distributors in 130 Cities

It's time we got *working* mad!

As we listen to the latest insults from Moscow, we're likely to get fighting mad.

Instead, we'd better use our heads and get *working* mad.

It is clear by now that Stalin and his gang respect just one thing—strength. Behind the Iron Curtain they've been building a huge fighting machine while we were reducing ours. Now we must rebuild our defenses—*fast.*

As things stand today, there is just *one* way to prevent World War III. That is to re-arm—to become strong—and to stay that way!

This calls for better productivity all along the line. Not just in making guns, tanks and planes, but in turning out civilian goods, too.

Arms must come first. But we must produce arms *at the same time* we produce civilian goods.

We can do this double job if we all work together to turn out more for every hour we work—if we use our ingenuity to step up productivity.

All of us must now make sacrifices for the common good. But we're working for the biggest reward of all —*peace with freedom!*

THE BETTER WE PRODUCE THE STRONGER WE GROW

A PUBLIC SERVICE PROJECT ★ THE ADVERTISING COUNCIL ★

FOR A FREE COPY OF "THE MIRACLE OF AMERICA"

MAIL THE COUPON to Public Policy Committee, The Advertising Council, Inc., Dept. B.P., 25 West 45th Street, New York 19, N. Y.

Name .....

Address .....

.....

The New President Of General Electric

Ralph J. Cordiner, new president of the General Electric Co., Schenectady 5, N. Y., succeeding Charles E. Wilson, has served as manager of five of the firm's departments in 24 years, and has been executive vice-president and a director of the company since 1949.

R. J. Cordiner

The retiring president, who is chairman of the new Defense Mobilization Board, completed 51 years of continuous service with GE in November 1950, starting as a messenger boy in 1899 with the Sprague Electric Co., which later became part of General Electric. Mr. Wilson rose to the presidency in 1939. From 1942 to 1943 he was vice-chairman of the War Production Board in Washington, after which he became executive vice-chairman, with full authority over all war production, serving in that post until 1944.

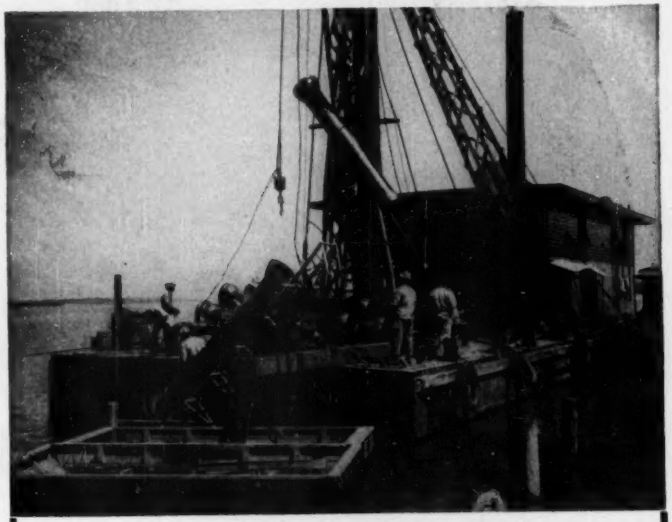
Mr. Cordiner was closely associated with Mr. Wilson during the post-war years in the planning of the new organization structure that is today's General Electric. This planning resulted in a vastly expanded plant. It had as one of its goals the decentralization of GE's diversified lines into integrated departments. One result is that today General Electric's plants, scattered from coast to coast, number about 120 and the firm's over-all business is at an annual rate approaching two billion dollars per year.

Mr. Cordiner was assistant to the president in 1943 and elected vice-president in 1945.

Two Assistant Sales Managers

The Pennsylvania Salt Mfg. Co., 1000 Widener Bldg., Philadelphia 7, Pa., has placed its six sales departments under the supervision of two assistant general sales managers, it has been reported by William P. Drake, vice-president and general sales manager.

R. S. Roeller will have general supervision of the agricultural chemicals, heavy chemicals and special chemicals departments, while Arthur G. Tunstall, Jr., will direct the B-K and household products, laundry and dry cleaning, and maintenance chemicals departments.



16" Water Pipe Line under John's Pass, Fla., being installed in 35 feet of water

BOYCE COMPANY

SUBMERGED PIPE LINES ALL OVER THE WORLD

Phone 3-2530 **CLEARWATER, FLA.**

ALABAMA PIPE COMPANY

General Sales Offices

ANNISTON, ALABAMA

TAKES **pride in announcing the resumption of pressure pipe manufacture at its recently completed modern plant located at Anniston, Alabama. This plant produces Super deLavaud cast iron pipe, centrifugally, in modern long lengths.**

Inquiries addressed to our nearest sales office will be appreciated.

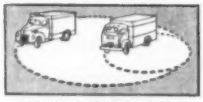
122 So. Michigan Avenue
Chicago 3, Ill.

3122 Coleman Road
Kansas City 2, Mo.

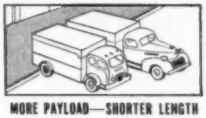
350 Fifth Avenue
New York 1, N. Y.

NEW EFFICIENCY IN NEW HAVEN WITH WHITE 3000 TRUCK

CHECK THESE EXCLUSIVE ADVANTAGES

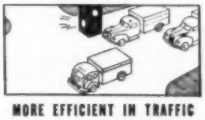


GREATER MANEUVERABILITY



MORE PAYLOAD—SHORTER LENGTH

NEW CAB SAVES DRIVER TIME



MORE EFFICIENT IN TRAFFIC

BETTER VISIBILITY... SAFETY

LOW LOADING HEIGHT

HERE'S THE WHITE 3000 engineered to the needs of the New Haven Water Company.

Designed expressly for operation in city service... in congested areas... this great, new White 3000 is an *entirely* new kind of truck... capable of doing more work in less time.

Greatly improved maneuverability... new handling ease... real driver features make it ideal for city services. It's tomorrow's truck... today!

Ask your White Representative for facts about the White 3000 for your business

THE WHITE MOTOR COMPANY

Cleveland 1, Ohio

For more than 50 years the greatest name in trucks

Tips its cab to service

Shunk Personnel Changes

J. A. Carrington

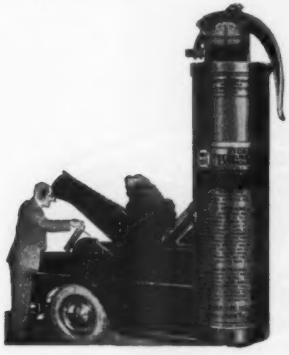
W. A. Wind

J. Austin Carrington has been appointed director of sales and Walter A. Wind, assistant to the general manager of the Shunk Mfg. Co., Bucyrus, Ohio. Shunk is probably the oldest and largest manufacturer of blades for all types of earth-moving equipment.

Mr. Carrington had been marketing and distribution executive with the General Electric Co., Schenectady, N. Y.

Mr. Wind served as production consultant to the Vermont Bureau of Industrial Research and had also been with the Titan Metal Mfg. Co., and Carnegie-Illinois Steel Corp.

Dry Chemical Fire Engine



A wheeled portable dry chemical fire engine has been reported as a new product of the American-LaFrance-Foamite Corp., Elmira, N. Y. Power packed with 350 pounds of fire extinguishing dry chemical compound, it is discharged at a maintained operating pressure of 200 psi by 2,000 psi of dry nitrogen.

Called the Alfco 350, this machine extinguishes flammable liquid and electrical type industrial fires. The firm reports that the density of the dispersion of its sustained pressurized discharge has a phenomenal effect of cooling and insulating the operator from the intense heat of the fire. Added to the discharge range of from 20 to 25 feet is the normal gravity pull of the Alfco dry chemical which is heavier than air. Its natural downward direction, accelerated by the pressurized charge behind it, resists the updraft of the air currents caused by the flames.

Engineering Consultants

Announcement has been made of the formation of Edwards, Kelcey and Beck, consulting engineers, with offices at 3 William St., Newark 2, N. J., and at 250 Park Ave., New York 17, N. Y.

Previously, the firms had been known as Edwards and Kelcey, owned by Dean G. Edwards and Guy Kelcey, and the other as Lawrence T. Beck and Associates. Edwards and Kelcey during the past five years have designed and supervised construction of modern expressways and other traffic and transportation engineering, and served as consultants to the Port of New York Authority, and the New Jersey State Highway Department.

Beck and Associates, who served as consultants to the South Carolina State Port Authority, have an engineering record on port, harbor, railway, and water-supply developments in the British Isles, Near and Middle East, and in this country.

Both organizations were consultants to the Citizens Budget Commission of New York City.

The combination of both firms will help to expand work here and abroad, specializing in the design and supervision of modern expressways, terminals, ports, harbors, and in traffic, transportation, sanitation and water and water-supply problems, industrial engineering and management.

BRAXMAR BADGES

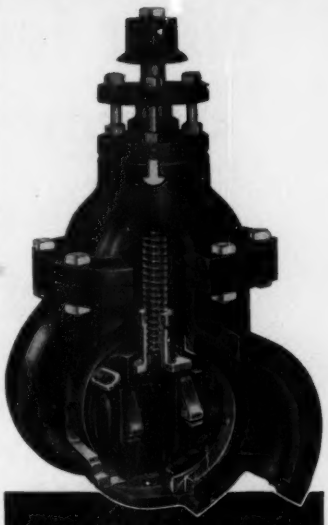
Standard Badges Since 1879

Write for circular illustrating badges for Police, Fire and other City, County and State Officials

John O. Veit, Pres.

C. G. Braxmar Co., Inc.
216 E. 45th St., New York 17, N. Y.

IOWA valves



Simple . . . rugged construction

MEET ENGINEERS RIGID 3 POINT SPECIFICATIONS

1 Solid bronze Wedges are placed loosely in two iron hooks which permit the wedging surfaces of the wedges to be at different angles with the wedges cast on the valve discs. *Solid bronze stem nut* is loose and independent of the gates and wedges, thus preventing binding or springing of the spindle or freezing of the gates.

2 All Working Parts are bronze or *bronze mounted* to safeguard against corrosion as well as to permit free and positive operation both in wedging the gates into contact with the seats and in releasing them.

3 Iowa Valves exceed A.W.W.A specifications and meet engineers choice for a quality product.

IOWA VALVE COMPANY
201-299 N. Talman Avenue • Chicago 80, Illinois
A subsidiary of James B. Clow & Sons

What features do you need in a Fire Hydrant?

1. Ample water supply without perceptible pressure loss?
2. Easy operation despite long intervals of closure?
3. Fast, easy, one-man removal of all working parts, *including main and drain valve seats,* through the hydrant top, without disturbing hydrant barrel?
4. Extremely rugged construction for long life and resistance to damage and operating abuse?
5. Positive, *automatic* flushing of multiple drains with each operation of hydrant?

ALL OF THESE requirements, as well as other equally important features, are incorporated in modern Darling hydrants . . . to give you a big plus value in extra protection, service life and over-all operating economy.

ASK FOR BULLETIN 4410—Bulletin 4410 gives complete information on Darling's advanced features. It also describes Darling hydrants of many different types designed to best meet varying requirements while offering the extra economy of interchangeable parts.

DARLING VALVE & MANUFACTURING CO.

WILLIAMSPORT 10, PA.

Joins Reeves Brothers

C. David Reich has joined the synthetic fabrics department of Reeves Brothers, Inc., 54 Worth St., New York 13, N. Y. He will be in charge of the development and promotion of new fibres and fabrics, with particular emphasis on industrial and automotive end uses.

Prior to becoming associated with Reeves, Mr. Reich was sales manager of the industrial and diversified fabrics division of Burlington Mills, including new product development.

Two-Cylinder Engine Has 20 to 30 HP

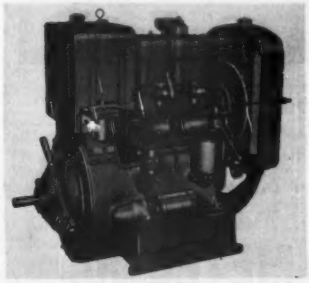
The addition of a two-cylinder engine to supplement the Type 4FSL single cylinder, has been reported by the Nordberg Mfg. Co., Milwaukee 7, Wis. Rated at from 20 to 30 hp within an operating speed range of 1,200 to 1,800 rpm, the 4FS2 has a 4½ inch-bore and 5¼-inch stroke. It is an extra-heavy duty, vertical, four-cycle, mechanical injection diesel engine.

This model is built as a complete self-contained, ready-to-operate unit and is offered as an electrical generating set, pumping unit, and with clutch or stub shaft power take-off for direction connection or belt drive.

Nordberg announces that its 4FS line of diesel generating sets provides a dependable source of electric power, available in direct or alternating current models from six to 20 KW in all standard voltages, 50 or 60 cycle. This unit is designed to generate light or power for shovels, cranes, and magnets, sand and gravel plants, resorts, saw mills, oil fields, tourist courts, and filling stations, as well as for standby service for public buildings, telephone companies, hospitals, hatcheries, locker plants, and dairies.

Among the other features are centrifugal pumping units of from 200 to 2,400 gpm at from 25 to 220-foot head; full pressure lubrication, a diaphragm-type fuel-oil transfer pump, mechanical flyball-type governor, and radiator-type cooling system.

For full details, write to Nordberg.



With centrifugal pump attachment, the Nordberg 4FS2-DE has a capacity of 300 to 2,400 gpm at 20- to 220-foot head.

Extremely fine and uniform fog droplets are claimed for the new low gallonage Bete nozzles.

For Fire Departments

Extremely fine and uniform fog droplets at low operating pressures are claimed for a new line of low gallonage nozzles by the manufacturer, the Bete Fog Nozzle, Inc., of Greenfield, Mass.

Employing the "pin-jet" impingement principle, the new nozzles have no internal parts and cannot clog with foreign particles smaller than the orifice size, according to the manufacturer. A new pin design reduces interference of the pin with the fog pattern, a defect common to previous nozzles of this type.

The new Bete nozzles are made in 10 orifice sizes from .015- to .080-inch diameter with flow rates from one to 100 gallons per hour. They are available from stock in brass with stainless steel pins, and made to order in other metals.

SPARLING MAIN-LINE METERS

for SERVICE and SATISFACTION

- - - Since 1919

Whether the flow is 20 gallons a minute or 400 MGD, the cost of the Sparling Meter is very small compared to the vital job it does with

Consistent Accuracy

There are Sparling Meters for Flanged, Bell & Spigot, Threaded, Steel, Iron, Concrete, Transite and Wood mains—and sizes from 2-inch, up.

Every Sparling Meter is a complete Totalizing unit, as easily installed as a valve or fitting.

RECORDERS, 24-Hour
RECORDERS, 7-Day
RECORDERS, 60-Day
INDICATORS
TOTALIZERS, Remote
BATCH CONTROLS
CONTROLS for Auto-Metered Chemical Feeds . . .

Bulletin 310 comes at your request

SPARLING METER COMPANY
INCORPORATED

LOS ANGELES 54.....Box 3277
CHICAGO 8...1500 South Western Ave.
SEATTLE 1.....1932 First Avenue
NEW YORK 17.....101 Park Avenue
626 Broadway.....CINCINNATI 2
6 Beacon Street.....BOSTON 8
726 Reserve Loan Life Bldg...DALLAS 1
66 Luckie St., N.W.....ATLANTA

SIMPLICITY of AMERICAN METERS

—THE MARK OF ULTIMATE REFINEMENT

Many devices that give us wonderful service today have passed through a period when their original simple designs became over-complicated, then by a process of refinement and simplification the best operating construction has been achieved.

This has happened with water meters. Design has been reduced to its simplest and most efficient form in the American Meter. As in the interchangeability of gear trains pictured, these are the ultimate in efficient simplicity.

Write for informative catalog today.

BUFFALO METER CO.

2902 MAIN STREET, BUFFALO 14, NEW YORK

Powered either by a portable generator or ordinary 110/115 volt current, this electrostatic sampler is used to trap all types of dusts, fumes, and smoke in atmosphere. The instrument gives health officials and industrial hygienists an important tool for investigation of air pollution causes.

Electrostatic Air Sampler Traces Pollution Sources

When the Donora, Pa., smog tragedy claimed 21 lives last year, a nationwide investigation was begun by federal, state, county, and municipal authorities to overcome atmospheric contamination. This disclosed a lack of fundamental information about causes and effects of air pollution.

The United States Public Health Service conducted an investigation and health officials became among the first users of a new weapon which traces air pollution sources.

Manufactured by the Mine Safety Appliance Co., Braddock, Thomas and Meade Sts., Pittsburgh, Pa., this small, simplified instrument collects accurate samples of all types of dusts, fumes, and smoke in the air. In the sampler, airborne particulates are trapped by electrostatic precipitation as air is drawn through an aluminum collecting tube. The tube then is sealed with plastic caps and the sample is ready. Now, because of its portability, the electrostatic sampler offers municipal and state health authorities concerned with air pollution an efficient and simple method for collecting atmospheric samples.

John Avery Dies

John Avery, president of the Roots-Connersville Blower Corp., 900 W. Mount St., Connersville, Ind., died of a heart attack on January 13.

Active in atomic development during World War II, he received the Kellex Key for outstanding service.

Mr. Avery had been associated with General Electric and the Allis-Chalmers Mfg. Co.

He had extensive experience in the blower and compressor field.

AMONG WATER WORKS MEN...

THE **ELLIS PIPE CUTTER**

is *Best* FOR CUTTING LARGE SIZES OF PIPE

No. 01 Cuts Pipe 4" to 8" | No. 1 Cuts Pipe 4" to 12"

Write for circular and price list No. 33AC, on our complete line of pipe cutting tools.

ELLIS & FORD MFG. CO.
FERNDALE 20, MICH.

FULTON *Shuredry* ON THE JOB

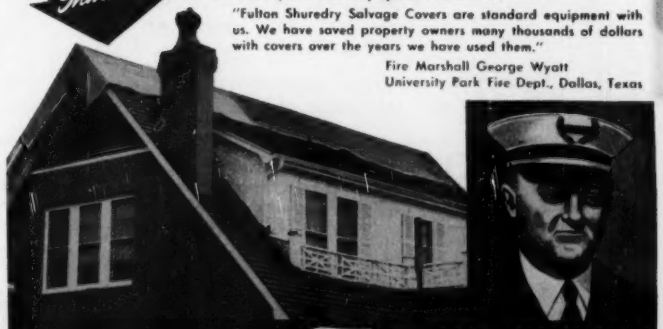
IN DALLAS TEXAS

Shuredry

When lightning struck the fine Dallas residence shown below, destroying part of the roof, Fulton Shuredry Green-Bak Salvage Covers were used to cover and protect the exposed portion from additional damage by rain or storm. This is just one of the many, many uses for Shuredry Salvage Covers, which have saved fire victims untold thousands of dollars in damage. Approved by National Board of Fire Underwriters and by Factory Mutual Laboratories, Fulton Shuredry tops every test for water penetration and water seepage. Specify Shuredry on your next order from your fire equipment dealer.

"Fulton Shuredry Salvage Covers are standard equipment with us. We have saved property owners many thousands of dollars with covers over the years we have used them."

Fire Marshall George Wyatt
University Park Fire Dept., Dallas, Texas

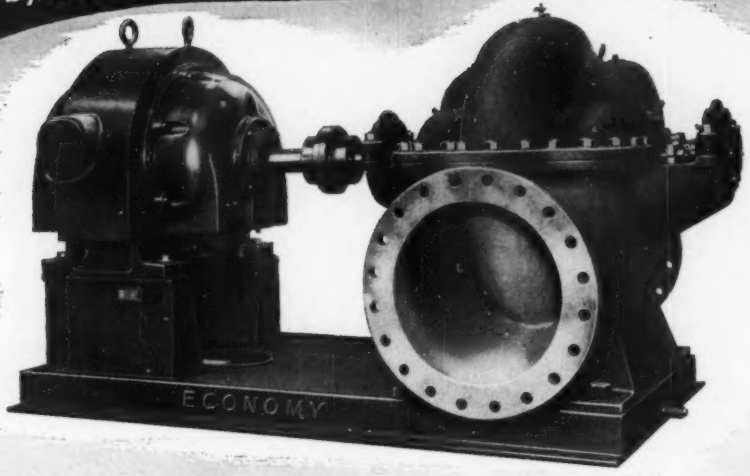


Use Fulton Triple Strength Tarp of 1000 Uses for Protection of Equipment and Supplies Exposed to Weather

Fulton BAG & COTTON MILLS
Atlanta • St. Louis • Dallas
Minneapolis • New Orleans • Los Angeles
Denver • New York City • Winter Haven, Fla.

when it's pumps, think of Economy

backed by over thirty years of specialized experience



The Type M Single Stage Double Suction Pump illustrated is just one of the many in the extensive line manufactured by Economy Pumps, Inc. This exceptionally rugged design is available in capacities from 50 to 30,000 gallons per minute at heads to 300 feet. A general purpose pump, it is ideally suited to general water supply or heavy mill service.

Maintenance expense is held to a minimum. Case records show Economy Pumps operating for fifteen to twenty years without replacement of major parts. However, should repairs be necessary, all parts subject to wear are renewable.

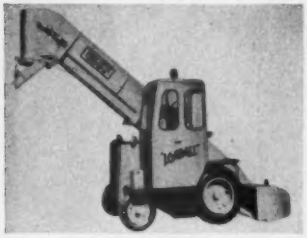
Economy Pumps are tested in accordance with the standards of the Hydraulic Institute and the A. S. M. E. under conditions duplicating as nearly as possible those encountered in actual service.

Catalog No. A750 gives complete design and construction details, also some interesting typical examples of performance, as well as handy selection tables. Write Dept. AB-2 for your copy.

Economy Pumps Inc.

DIVISION OF HAMILTON-THOMAS CORP., HAMILTON, OHIO

Loader Handles Any Material Without Belt Changes



This new, all-purpose loader is powered by a four-cylinder, air-cooled gasoline engine.

A new machine specifically designed for the smaller municipality or contractor with year-'round truck-loading problems and a limited budget has been introduced by the N. P. Nelson Iron Works, Clifton, N. J. According to the manufacturer, this all-purpose loader known as the Loadall, is the only machine now in production which will handle sand, snow, gravel, coal, cinders, humus, leaves and salt without belt changes or use of special attachments.

It can also be employed in loading road-patching materials in summer as in the heaviest of winter snows.

The Loadall, powered by a four-cylinder, air-cooled gasoline engine, travels under its own power at road speeds up to 10 mph with working speeds to 6½ mph. It loads heavy materials at from 1¾ to 2¼ cubic yards per minute and snow at from six to eight cubic yards per minute. Twenty-four-inch spirals have replaceable toothed digging edges.

Complete information can be obtained from the N. P. Nelson Iron Works or from your nearest Nelson dealer.

Signs of Plexiglas that look exactly alike by day and night mark the district headquarters of the Kentucky State Police. The copy is in black, yellow, and white fused on the inner surface. Standard slimline lamps provide even illumination. The signs, known as "Plastilux 500," were created by Neon Products, Inc., of Lima, Ohio.

Concrete slabs made this clarifier simple and inexpensive to build.

Precast Clarifier Wall

Concrete silo slabs formed the settling basin-structure for this clarifier used by the Central Silica Co., of Zanesville, Ohio, and offers possibilities for municipal water and sewage clarifier construction. The slabs are held in place by steel rods and turn-buckles which are in turn covered with gunite.

The slabs are a product of the Marietta Concrete Corp., Marietta, Ohio. The clarifier mechanisms were supplied by the Dorr Co., Stamford, Conn.

TENNESSEE CORPORATION
Ferri-Floc
FERRIC SULPHATE

Taste and Odor Control

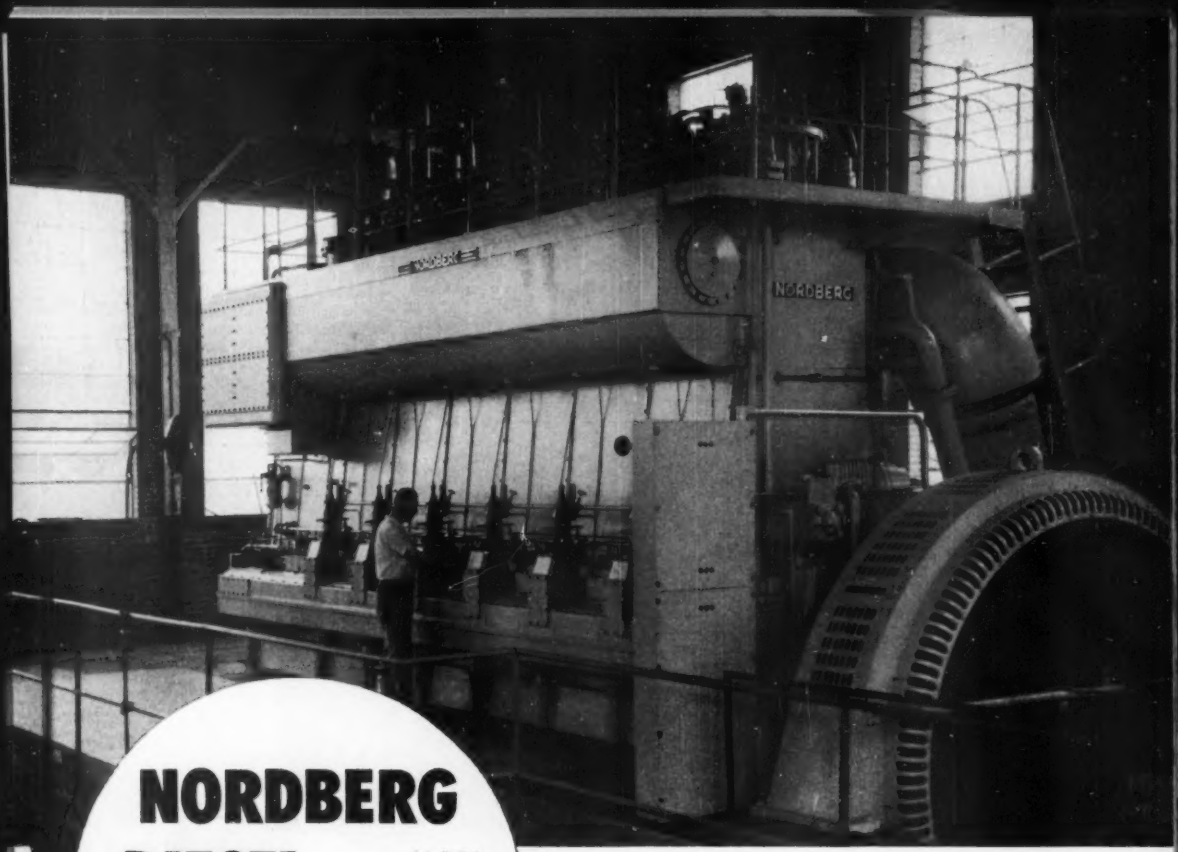
Proper and efficient coagulation has long been recognized as an aid in removing certain types of tastes and odors. It would be erroneous to assume that any coagulant could completely solve your taste and odor problems without assistance from other control measures. However, it is wise to take advantage of efficient coagulation in the solving of these problems.

The above is just one of the many advantages of FERRI-FLOC, the superior coagulant.

FREE BOOKLET

A postal card or letter will bring you our booklet on the advantages of FERRI-FLOC — Tennessee Corporation, Grant Building, Atlanta, Georgia, or Lockland, Ohio.

TENNESSEE CORPORATION
Atlanta, Georgia — Lockland, Ohio



NORDBERG DIESEL *saves* $100,000 *a year!*

HARRISONBURG, VIRGINIA, CUTS GENERATING COSTS IN DIESEL-STEAM-HYDRO SYSTEM WITH 2400 H.P. DIESEL BURNING ECONOMICAL NO. 5 FUEL . . .

FROM 1904 to 1923, the city of Harrisonburg, Va., relied on hydro electric power entirely. In 1923, a new steam plant was put in operation to meet the city's growing power requirements. In 1949, a 2400 h.p. Nordberg Diesel was installed to handle the rapidly expanding load and to reduce power generating costs.

This Nordberg two-cycle unit, driving a 1690 kw generator, is saving Harrisonburg $100,000 a year as compared with steam generating costs, and has become the major power producer in the city's diesel-steam-hydro system. The Diesel is operating 24 hours a day and producing at the rate of 10,000,000 kw. hrs. a year. Burning an economical No. 5 fuel oil, its record has been so impressive that the city council has voted to expand the Diesel plant and abandon steam as a regular source of power.

Here, then, is an outstanding case study of the way in which Nordberg Diesels can cut power costs. Write for further information on Nordberg two and four-cycle oil burning and Duafuel Diesels and gas burning engines to meet your specific power needs . . . sizes from 10 to 9600 h.p.

NORDBERG MFG. CO., Milwaukee 7, Wis.

P950

BUSCH-SULZER
A DIVISION OF NORDBERG

NORDBERG
DIESEL ENGINES

D. B. Olen

C. Piehl

H. G. Engel

V. M. Anderson

Four Wheel Drive Lists Appointments

Five appointments have been announced by The Four Wheel Auto Drive Co., Clintonville, Wis. They include: Donald B. Olen who holds the newly created position of works manager; Clarence Piehl, executive assistant to M. O. Stockland, director of sales; H. G. Engel, office sales manager; V. M. Anderson, who succeeds Mr. Engel as manager of the firm's western sales zone, and Douglas Frost, cost department manager.

R. A. Olen vice-president and general manager, reported that Donald B. Olen will have direct supervision of the engineering and manufacturing phases of operations. The objective is to unite production and process engineering functions into one manufacturing facility.

Mr. Piehl has served as assistant manager and manager of the cost department.

First Self-Contained Grass Trimmer

A new grass trimmer is being distributed by the Arthur G. Huson Co., 18 Lindsley Ave., West Orange, N. J. Known as the Trim Master, the tool incorporates the first self-contained grass trimmer ever developed.

It is powered with a ¼-hp, two-cycle motor and its rotary blade travels at 8,000 rpm. The operator stands erect with a balanced instrument to eliminate the use of hand shears or sickles.

Originated and designed under the supervision of Arthur G. Huson, the Trim Master has eliminated cable and generator and added speed and saving to grass-trimming operations.

Own Punched-Card Machines At Less Than Rental

The many uses of punched-card or tabulating machines have become known to an extent where smaller municipalities as well as the big cities want punched-card advantages. These machines will not only do a complete accounting operation such as tax and utility billing and accounting or both and more, but can be of great value in storing the data and statistics of any accounting operation though it be performed by bookkeeping machines. Bookkeeping and punched-card machines can be hooked up to work together. In such an arrangement, the bookkeeping machine produces the records, such as payroll, checks, and employee's ledger, while the tabulating machine punches these data into cards for future statements and reports.

To place this important punched-card equipment within the reach of medium-sized and small cities, Remington Rand has worked out a monthly payment plan that is less than a rental fee and results in the municipality owning the machines after 100 months. This use-purchase plan is described in detail in a new folder entitled "Everything to Gain, Nothing to Lose" available from Remington Rand, Inc., 315 Fourth Ave., New York 10.

Another outstanding Smith-Blair product . . .

Here's a clamp so simple that field emergencies have proved it can be installed under water and under 85 pound pressures by "feel" alone! Its matched copper-armor gaskets go right into proper position without coaxing. And it assures a complete shut-off of leaks on the first tightening of the clamp. The Smith-Blair Full Circle Clamp is unsurpassed for quick, economical, permanent leak repair service. Write for bulletin today, or see your nearest Smith-Blair Distributor.

For coupling pipe sections or for permanent leak repairs on broken or split cast iron, cement-asbestos, or steel pipe. SERIES 3-A 7½" to 30" widths for nominal 2, 3, 4, 6 and 8 inch pipe. SERIES 3-B 7½" to 30" widths for nominal 4, 6, 8, 10 and 12 inch pipe. Furnished with Duronze bolts on order.

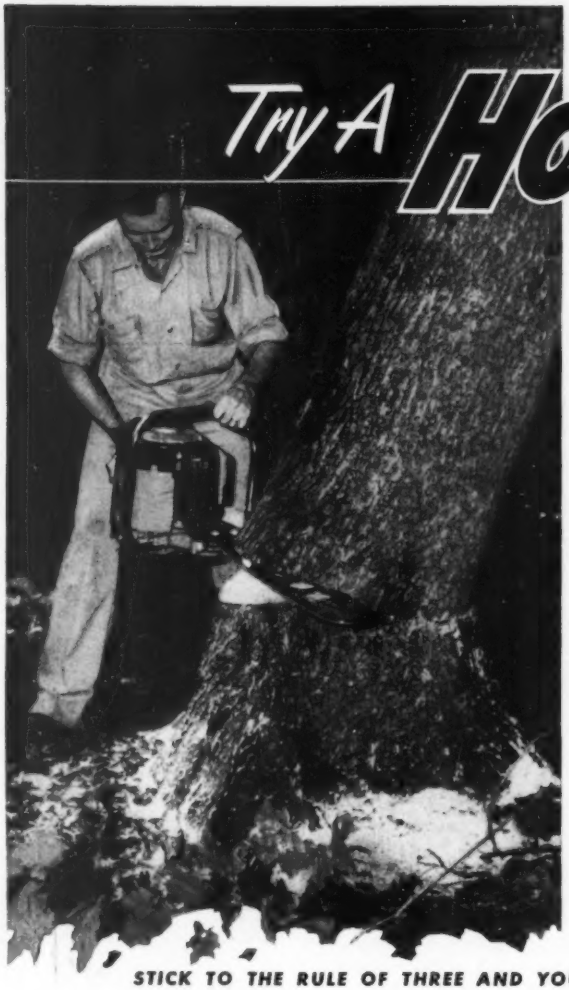
Write for name and address of nearest Smith-Blair Distributor.

End view of clamp showing built-in Copper-Armor Gaskets

SMITH
Water works supplies and specialties
BLAIR
INC.

SOUTH SAN FRANCISCO, CALIFORNIA

ALSO...BRONZE SERVICE CLAMPS • STEEL & C. I. FLEXIBLE COUPLINGS • FLEXIBLE REDUCING COUPLINGS



Try A HOMELITE

THE *One Man* SAW THAT DOES THE WORK OF OTHER TWO MAN SAWS

You have to see it to believe it. You have to use it to know it. But once you try a Homelite . . . the newest and most startling one man gasoline-engine-driven chain saw . . . you're sold on it *one hundred per cent.* Whether you're using it for cutting, bucking or clearing trees or for cutting timber or piling, its complete ease of handling and fast cutting thoroughly convince you that here is a one man saw that truly does the work of other two man saws . . . a saw that will cut your cutting costs right down to the solid ground. Just ask for a free demonstration. We'll gladly give it anywhere.

STICK TO THE RULE OF THREE AND YOU'LL ALWAYS STICK TO A HOMELITE

1. PERFORMANCE The high, steady power of the famous Homelite engine, driving the special chrome plated perma-sharp chain, gives you unsurpassed cutting performance.

2. DEPENDABILITY A Homelite Chain Saw's dependability has been established by Homelite's quarter century of building more than 285,000 gasoline engine driven units.

3. SERVICE Forty-eight factory service branches located throughout the country are completely equipped and instantly ready to keep your Homelite Gasoline Engine Driven Chain Saws *always* on the go.

Send for free bulletin on HOMELITE One Man Gasoline Engine Driven Chain Saws

PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE
CORPORATION

102 RIVERDALE AVENUE • PORT CHESTER, N. Y.

Named Sales Engineer

H. C. Allington, general manager of sales of the Colorado Fuel and Iron Corp.'s New York City offices, has announced the appointment of L. A. Watts as assistant general sales manager of the Wickwire Spencer Steel Division.

L. A. Watts

Mr. Watts joined Wickwire Spencer as a chemist in the Buffalo plant in 1938 and subsequently became foreman, assistant superintendent and metallurgist, and manager of the general wire sales department. He has also been manager of the Detroit district sales office and established the pig iron and semi-finished sales department, which he will continue to supervise.

Mr. Watts will be with the division's executive offices at 500 Fifth Ave., New York 18, N. Y.

Spreads Salt From Truck End-Gate

Announcement of a new spreader attachment to spread salt and calcium chloride from truck end-gates has been made by the Baughman Mfg. Co., Jerseyville, Ill.

The "Salt Miser" actually throws the salt, rather than blowing it with air. The manufacturer states that material can be spread in a controlled (wide or narrow) pattern from 8 to 40 feet The distributor is located on the left side of the unit for better distribution over the entire road.

A seat is provided for the operator that gives him a full view of the highway and enables him to have constant control of the volume and spread pattern. Volume can be controlled from a fine to a heavy spray.

Powered by an air-cooled, enclosed 2-hp engine located away from the spreader so that corrosive elements in the spreading material will not affect it, the new unit has the impeller as the only working part. Its hopper, impeller, valves, and directors are of stainless steel, and its shipping weight, about 400 pounds.

The "Salt Miser" throws the salt, rather than blowing it with air.

DISSTON ANNOUNCES

A NEW FIGHT WASTE PROGRAM

to help you get the most out of your chain saw through proper preventive maintenance

Your present chain saw is more valuable than ever!

The times are serious. We don't know what lies ahead. But we do know this . . .

With the increasing shortages of strategic materials, new chain saws will become harder to get. Certain parts may be hard to get . . . or you may have to wait a long time for delivery. At the same time, there will be an increasing demand for chain saws. Forest products will be needed more than ever and the industrial use of chain saws will increase by leaps and bounds.

Now is the time to take care of the chain saw you have . . . and Disston is going to help you do it.

Disston is making available—absolutely without cost—valuable preventive maintenance booklets and check-up charts which will help you maintain your saw in tip-top condition. **Send for your free copies today!**

Disston dealers are cooperating in this program. Their strategically located shops are completely at your service. Take your saw in for a check-up now. These experts can spot little troubles before they become big and expensive troubles.

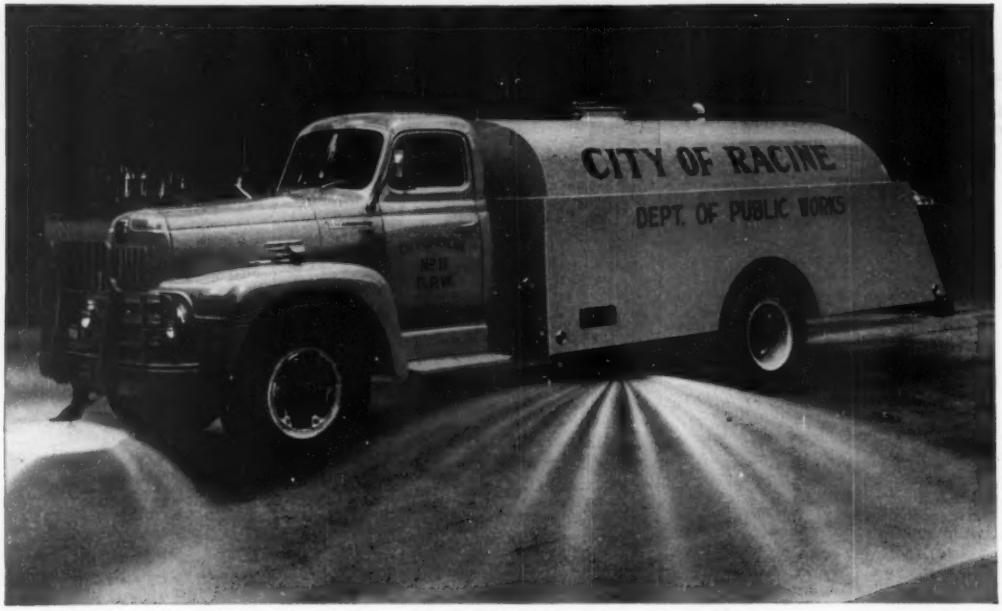
DISSTON IS MAKING IT EASY FOR YOU TO MAINTAIN YOUR SAW . . . AND TO SERVICE YOUR SAW

HENRY DISSTON & SONS, INC.

11B Tacony, Phila. 35, Pa., U.S.A.

In Canada, write: 2-20 Fraser Ave., Toronto 3, Ont.

This International { flushes the street in summer / plows the snow in winter



The International Truck you see in the picture powers a flusher unit in the summer and a snow plow in the winter.

But, just because it does double duty, don't think that its operating and maintenance costs are out of line. In addition to doing a good job of cleaning streets in the summer and of removing snow in the winter, this new International also does a good job of keeping within the budget.

4 big advantages. An International Truck is a good friend of the taxpayer as well as of the department of public works. Here are 4 good reasons why:

1. Valve-in-head engines. America's largest exclusive truck engine plant has developed 3 great new series of valve-in-head truck engines. These new power plants give more power for more efficient operation *plus* more economy for more thrifty performance.

2. Easy handling. New International Trucks handle almost like passenger cars. They give more positive control from a more comfortable position and turn easily in the shortest practical circle.

3. "Roomiest cab on the road." The new Comfo-Vision Cab brings out the best in a driver. It offers full front visibility through a one-piece, curved Sweep-sight windshield. It offers comfort-packed, easily adjustable seating. It offers controlled ventilation.

4. Traditional heavy-duty engineered stamina. Every model from 4,200 to 90,000 pounds GVW has extra ruggedness built into every part. This assures you of the savings in operation and maintenance and the long life that have kept Internationals first in heavy-duty truck sales for 19 straight years.

Get all the facts now. No matter what type of truck you need, you'll find exactly the right model in the world's most complete line of trucks. Call your nearest International Truck Dealer or Branch for the full story.

International Harvester Builds
McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power
Refrigerators and Freezers

International Harvester Company • Chicago

See the new

INTERNATIONAL TRUCKS

Every model heavy-duty engineered to save you money

This portable air compressor is available for skid or four-wheel spring mounting and has an actual air delivery of 600. cubic feet.

Portable Air Compressor

Schramm, Inc., West Chester, Pa., manufacturer of portable and stationary air compressors, reports issuance of Bulletin No. 5025 which illustrates and describes its latest edition to its line of equipment of portable compressors.

The four-wheel Model 600 is spring-mounted, has a six-cylinder diesel engine and an actual air delivery of 600 cubic feet. The firm recommends it for operating two large-size wagon drills, six heavy-duty rotating drills, large cement guns, and sandblasting outfits for major engineering projects.

Its simplified design includes dual fan belts and engines and compressor speeds produced to operate at maximum diesel engine efficiency.

For a copy of Bulletin No. 5025, write to Schramm, Inc.

First Displacement Meter For 1,000 PSI Take-Off Service

Transmission companies, gas producers, and utilities are able to meter accurately wide ranges of delivery of gas at the take-off point because of the first high-capacity positive-displacement meter which can handle gas at pressures up to 1,000 psi, reports the manufacturer, the Rockwell Mfg. Co., Pittsburgh 8, Pa.

The new meter, the No. 2½ Rockwell, weighs 950 pounds, is encased in high-tensile alloy steel castings with 1¼-inch studs joining the body and cover, and has capacities of 31,000 and 46,000 cfh of gas at pressure drops of six and ten inches of water column respectively. Its index plate carries combination drillings so that standard indexes (vertical, horizontal or direct-reading) can be oriented in either of two directions and the meter can be fitted with a seven-day clock-driven combined record gage for easy conversion of actual volumes to corrected volumes.

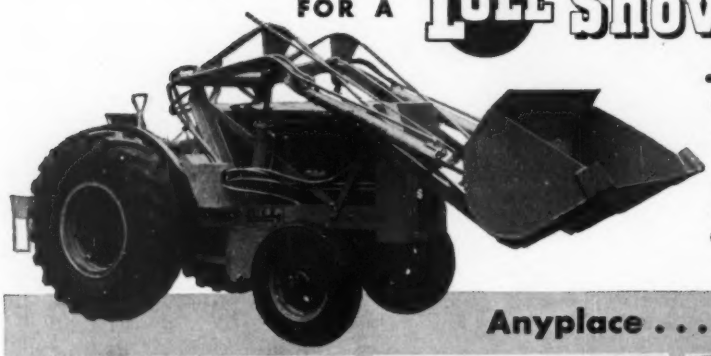
For full details, write to the Rockwell Mfg. Co.

Valve closes with water pressure
When broken in a traffic accident, some hydrants may release a stream of water which not only lowers pressure, but also causes costly damage to property. Not so the Mathews. Its compression-type valve stays seated.
MATHEWS
HYDRANTS
Made by R. D. Wood Company
Public Ledger Building, Independence Square, Philadelphia 5, Pa.
Manufacturers of "Sand-Spun" Pipe (centrifugally cast in sand molds) and R. D. Wood Gate Valves

MATHEWS MODERNIZED HYDRANTS OFFER THESE ADVANTAGES: All working parts contained in quickly replaceable barrel • Stuffing box cast integral with nozzle section—positively leakproof • Head turns 360° • Replaceable head • Nozzle sections easily changed • Nozzle levels raised or lowered without excavating • Protection case of "Sand-Spun" cast iron for extra strength, toughness, elasticity • Modern barrel makes an old Mathews good as new • Mechanical joint pipe connections, too

OPERATORS SAY:

there's Always a job FOR A LULL Shoveloader



- DIGGING
- LIFTING
- LOADING
- TRANSPORTING
- SCRAPING
- FILLING
- BULLDOZING

Anyplace . . . Anytime . . .

RURAL

RESIDENTIAL

URBAN

LULL

ATTACHMENTS that make your SHOVELOADER adaptable to more jobs:

- Material Bucket
- Alternate Material Bucket
- Loose Material Bucket
- Coal or Snow Bucket
- Pavement Ripper Bucket
- Concrete Bucket
- Standard Bulldozer
- Moldboard Extension for Standard Bulldozers
- Special Width Bulldozer
- Lifting Crane
- Log Lifting Forks
- Fork Lift Attachment
- Sweeper

"YOU NAME THE JOB and a LULL SHOVELOADER can do it!" say amazed operators everywhere. It is the ideal equipment for Winter or Summer operations—rips pavements, digs hard materials, lifts and loads, scrapes and fills, as well as bulldozes. The LULL SHOVELOADER is the most powerful front end tractor loader available. In addition, the long reach bucket permits rear loading of trucks . . . lets traffic proceed at normal flow. Fast power hydraulic action plus close-in maneuverability makes the LULL SHOVELOADER efficient anywhere . . . anytime.

- Let your nearest LULL distributor demonstrate the flexibility of the LULL SHOVELOADER for all year 'round service.

Get LULL SHOVELOADER facts TODAY.
MAIL THIS COUPON NOW!

See the LULL SHOVELOADER in action and you will know it's the best.

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LULL SHOVELOADER AND ATTACHMENTS

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Company.....
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City..... Zone..... State.....

LULL Manufacturing Company
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Designers and Builders of
The Largest Line of Allied Equipment
for Industrial Wheel Type Tractors

SHOVELOADERS • UNIVERSAL LOADERS • FLUID-DRIVEN SWEEPERS • LULLDOZERS • SHOULDER MAINTAINERS

Motorcycle Pioneer Dies in Auto Accident

Arthur Davidson, secretary and general sales manager of the Harley-Davidson Motor Co., Milwaukee 1, Wis., was killed with his wife, Clara, during a two-car collision on December 30th. He was 69 years old.

Arthur Davidson

Last of the founders of Harley-Davidson, Mr. Davidson, with his boyhood friend, William S. Harley, and later associates, Walter Davidson and William Davidson, founded the motorcycle firm.

It was back in 1901 that Arthur Davidson and William S. Harley conceived the idea of taking the pedaling out of bicycling by inserting an internal combustion engine. After experiments with machines, the first real Harley-Davidson motorcycle was built in 1903.

Mr. Davidson, who had been a patternmaker, made patterns for the first motorcycle, before organizing his own firm. He was active in the Boy Scouts of America and other youth groups. He was president of the American Motorcycle Association, of the Motorcycle and Allied Trades Association, and of the Kilbourn Finance Corp.

PIPE FITTINGS

Warren fittings, like Warren pipe, are made in all sizes and to all standard patterns for use with cast iron pipe of standard designs.

Special castings to meet your individual requirements may make use of our large stocks of non-standard patterns.

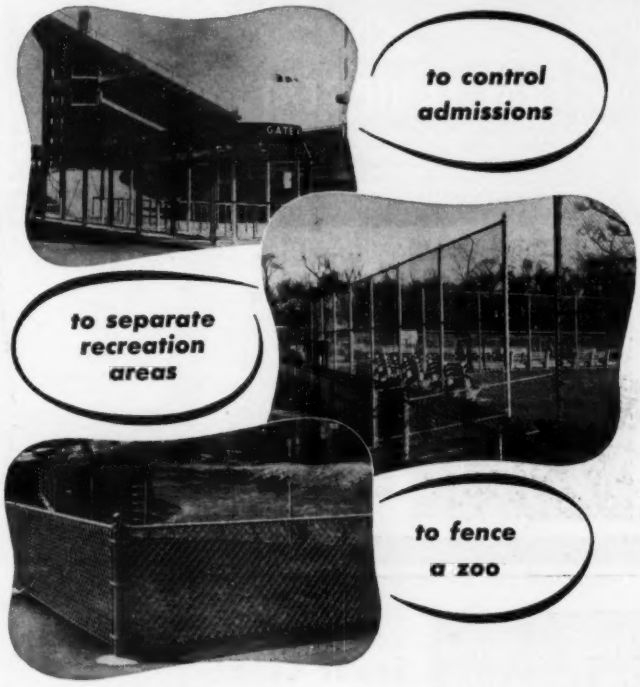
BELL & SPIGOT—FLANGE —SHORT BODY—PLAIN ENDS — MECHANICAL JOINT — SPECIALS

Sizes—2" to 84"

WARREN FOUNDRY & PIPE CORP.

55 Liberty St. New York, N. Y.
72 Federal Street Boston, Mass.

How progressive municipal authorities are using CYCLONE FENCE



● Every municipal recreation project must have good fencing if it is to be protected, if patrons—whether as spectators or at play—are to be safely guarded. And that's a job for Cyclone Fence. All over the country municipal authorities are specifying Cyclone when they plan their new projects . . . and are finding that no other fence meets their needs so well.

Our engineers are experienced in every type of fencing problem. Get in touch with our nearest sales office for advice and a free recommendation. There's no obligation.

NO JOB IS TOO LARGE
NO JOB IS TOO SMALL
FOR CYCLONE*

CYCLONE FENCE DIVISION
(American Steel & Wire Company)
WAUKEGAN, ILLINOIS · BRANCHES IN PRINCIPAL CITIES
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS CYCLONE FENCE

Cyclone is the trade-mark name of fence made only by Cyclone Fence Division. Accept no substitute.

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Cyclone Fence, Waukegan, Ill., Dept. B-21
Please mail me, without obligation, a copy of "Your Fence."

Name.....
Address.....
City.....State.....
I am interested in fencing:
☐ Industrial; ☐ School; ☐ Playground; ☐ Residence.
Approximately .....feet

UNITED STATES STEEL

YOU GET PPD*
·PIN POINT DETECTION
ONLY WITH
GOLDAK EQUIPMENT

The name GOLDAK, on electronic instruments, eliminates guesswork... it's your assurance of Pin Point Detection at all times, in any kind of weather. Throughout the world, with companies who need instruments that are accurate and durable, first choice is GOLDAK.

MODEL L46
SENIOR
LEAK DETECTOR
Detect costly leaks in water and low viscosity fuel lines, in their exact position. Completely portable, simple to operate. Latest electronic improvements and high quality parts, assures unequalled performance. Save time and labor, eliminate costly waste leakage with Goldak Model L46.

MODEL 620
BOX & VALVE
LOCATOR
Pin Point Detection of Goldak's Model 620, saves you time and money, with immediate location of Buffalo Boxes, Valves, Covers and Buried Metals. Large areas surveyed in a few moments. Sharp, clear signals. Untiring operation, weighs only 8 lbs. Sturdily constructed, all-weather use. High quality parts assures maximum sensitivity, low operating and nominal replacement costs.

Write for
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The GOLDAK Company
Leading Makers of
PIPE LOCATORS
Since 1933

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GLENDALE 1, CALIF.

Newly Improved
OK CHAMPION
POWER SEWER
CLEANER

DON'T LOSE
Sewer Capacity

Clear your sewer lines regularly. Keep up full carrying capacity and you save money—in lower maintenance cost and avoiding costly backwash. Order OK Champion Power Sewer Cleaner equipment and your men remove roots, dirt and other obstructions from any storm or sanitary sewer in ONE operation. All men work above street level.

OK Champion cleaners are regularly clearing sewers all over the world. New improvements make them better than ever. Send for literature.

CHAMPION CORPORATION
Hammond, Indiana

GET FULL FACTS NOW!

CHAMPION CORPORATION, 4716 Sheffield Ave., Hammond, Ind.
Please send information on how the Improved OK Champion Power Sewer Cleaner cuts sewer cleaning costs.

NAME.....TITLE.....

ADDRESS.....

BURKE-BUILT PARK BENCHES

COMFORTABLE!
WEATHER RESISTING!

Sturdy construction. Heavy, select hardwood slats, sanded and oiled. Channel iron braces and tie braces. In three sizes—4', 5', 6'. Painted olive green—or unfinished if desired.

Write Dept. K

Made by The J. E. Burke Co. manufacturers of a complete line of Playground Equipment. The line includes: Climbing structures, Swings, Slides, See-Saws, Merry-Go-Rounds, Turning Bars, Horizontal Ladders, Etc.

THE J. E. BURKE CO., FOND DU LAC, WISCONSIN

Double-Faced Accident Prevention Signs
A Positive Warning Both Ways
ENAMEL FABRIC

REDTECO (WHITE ON RED) · MEN WORKING · YELTECO (BLACK ON YELLOW)

Clear Cut Lettering—Will Not Crack, Peel or Break
Light Weight Permits Safe, Easy Posting
Reflectro Letters For Night Use

WRITE FOR CIRCULAR

THOS. E. COLLINS & CO.
4661 Maryland Ave. St. Louis 8, Mo.

C. L. Hardy

T. Z. Hayward

Ryerson Elections

Charles L. Hardy is the new president of Joseph T. Ryerson & Son, Inc., Chicago 80, Ill. He replaces Everett D. Graff, who becomes chairman of the executive committee. Thomas Z. Hayward was named vice-president, in charge of sales.

Educators, Diesel Engineers Hold Technical Conference

The Cooper-Bessemer Corp. of Mount Vernon, Ohio, recently served as host at a technical conference between eastern educators and diesel engineers at its Grove City, Pa., plant. The purpose of the meeting was to impart first hand, the latest information on new diesel developments for more comprehensive instruction on the principles of diesel operation in engineering and technical schools. This session was sponsored by the Diesel Engine Manufacturers Association.

The program included a plant tour to demonstrate the most advanced production practices used today in the manufacture of diesel equipment, including foundry procedures, machining methods, and engine-testing facilities.

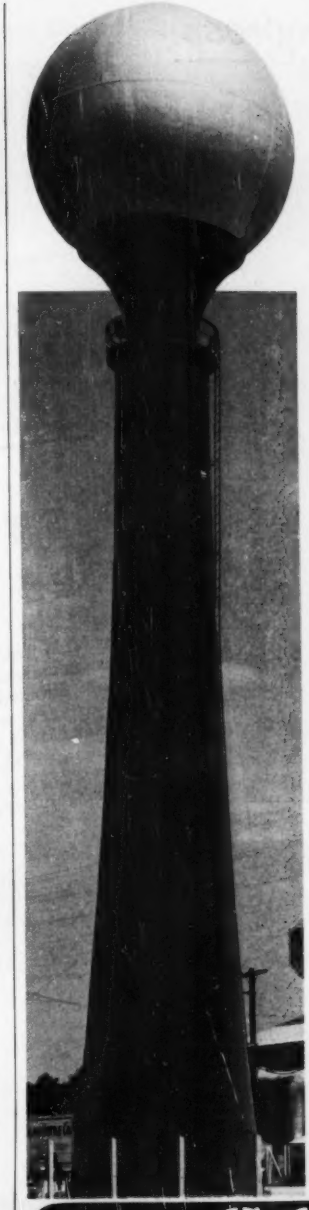
Several Cooper-Bessemer engineers presented technical papers on the latest and most significant developments in the diesel industry.

C. H. Vaupel, resident manager of Cooper-Bessemer, had charge of the meeting.

Acquires Pump Firm

H. C. Ramsey, president of the Worthington Pump and Machinery Corp., Harrison, N. J., has announced that the firm has acquired Wintroath Pumps, Inc., of Alhambra, Calif. He stated that the Wintroath Co. will operate as a wholly owned subsidiary of Worthington, continuing under the present manager, with Boyd Kern remaining as president. Organized in 1929, Wintroath manufactures vertical-turbine well pumps, a type used extensively in irrigation projects.

Also reported was the appointment of Wilbur R. Leopold as assistant to Vice-President T. Cruthers, and Clarence S. Wentworth as manager of the Detroit office. Mr. Leopold will be associated with the company's public works projects.



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The COLE Spherical Tank on Tubular Tower is a pioneer in its field. We designed and erected first tank of this character built.

Installations of this character are made for Municipal Water Works, Domestic Service and Fire Protection. It provides an attractive and serviceable unit—economical to maintain, efficient in service and pleasing in appearance.

Write for special booklet on these modern welded Spherical Tanks which provide gravity water pressure . . . and for copy of latest Cole catalog—"Tank Talk."

R. D. COLE MFG. CO.
NEWNAN, GA. Established 1854

TANKS TOWERS CYLINDERS VESSELS

"Signposts" of Progress

in BETTER WATER STORAGE

Elevated Steel Tanks

by

PITTSBURGH ·DES MOINES

Dependable water service for the progressive community is marked with distinction by P-DM Elevated Steel Tanks. Handsome in appearance, efficient in performance, economical to use and maintain, Pittsburgh-Des Moines Tanks are always a sound investment. *Write for our latest Water Storage Brochure.*

PITTSBURGH · DES MOINES STEEL CO.

Plants at PITTSBURGH, DES MOINES and SANTA CLARA

Sales Offices at:

PITTSBURGH (25)	3412 Neville Island	DES MOINES (8)	913 Tuttle Street
NEW YORK (7)	Room 915, 270 Broadway	DALLAS (1)	1217 Praetorian Bldg.
CHICAGO (3)	1216 First National Bank Bldg.	SEATTLE	920 Lane Street
	SANTA CLARA, CAL.	619 Alviso Road	

Fast Collecting from Kansas City's Parking Meters

Collecting coins from 200 meters in (left) one day and in (right) half day by new method in Kansas City, Mo., where 1,000 Duncan Miller meters are operating.

For the last several years, parking-meter receipts in Kansas City, Mo., have increased measurably. The average monthly receipts for the last three years, for example, were $6,298 in 1948; $7,032 in 1949; and $7,548 in 1950. To meet the growth, a new technique for collecting the coins from the Duncan Miller meters has been put into effect by the Division of Treasury in the Finance Department.

A lockable, five-gallon steel hopper, mounted on two wheels has been substituted for the traditional suitcase. Formerly, the collector would start on one of his 20 routes with two suitcases, each containing 25 empty locked coin boxes. Collection consisted of replacing the partially filled coin boxes in the meters with empty coin boxes. The collector would return to the Treasurer's Office with 50 partially filled locked boxes whereupon the boxes would be unlocked with a key kept in the Treasurer's Office and the coins sorted, counted, and packaged. The collector now starts on one of his five routes, the number of routes having been reduced by 15, with the empty locked and mobile hopper shown here. The collection process now consists of shaking the partially filled coin boxes directly into the hopper and after making 200 collections, the collector returns to the Treasurer's Office. The hopper is unlocked with a key maintained in the Treasurer's Office and the coins processed.

Collection time has been cut in half by the new procedure as the collector makes 200 collections in one-half a day, compared with a full day under the former method.

The mounted hopper costs $130. The expense will be regained by the City within two months as a result of personnel saving.

R. F. AGARD
Director of Finance
Kansas City, Mo.

Retires from Firm

Harrison, Ballard and Allen, 123 E. 77th St., New York 21, N. Y., announce the retirement of Ailan S. Harrison from active participation in the firm which will continue business under the same name.

James H. Hansen was named construction engineer.

YOUR EXPENSIVE OFFICE MACHINE IS SAFE ON A "NON-CAPSIZABLE" OFFICE MACHINE STAND

Tusco

TUSCO STANDS ARE ADAPTABLE TO OVER 95% OF ALL OFFICE MACHINES

Tusco Stands provide a combination of strength, stability, operator comfort and beauty available in no other office machine stand. Equipped with an adjustable ball foot the TUSCO Stand provides solid support for the heaviest, most active machines on the most uneven floors.

TUBULAR SPECIALTY MFG. CO.
1940 Stanley Ave. Detroit 8, Mich.
ESTABLISHED 1921

DO YOU KNOW that there are more Lyle Street Name Signs serving American cities and towns than those of any other make?

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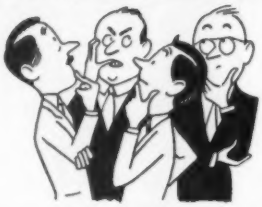
LYLE SIGNS, INC.
2720 University Avenue, S. E.
Minneapolis, Minnesota

Undecided?



Don't debate any longer
specify a
BARTON-AMERICAN FIRE PUMP
on your next fire truck

MODEL DMB

● Whether you're in the market for a front mounted or a midship mounted fire pump be sure to specify Barton-American—the finest fire pumps made. Each Barton-American fire pump is built to rigid specifications and to really do a job. Each meets all Underwriters' tests for conventional capacities and pressures PLUS sufficient pressure for fog gun service. There is a model built to meet every need and to fulfill your every requirement.

Write today for information about our UA-50 front mounted pump, our Duplex-Multistage (DMA) midship mounted fire pump and our four-stage DMB as shown above.

ONLY THE BARTON-AMERICAN MODEL DMB HAS ALL THESE EXCLUSIVE FEATURES

1. Maximum flexibility in operation. 2. Low engine speeds due to four-stage construction. 3. One-point oil lubrication for all gears and bearings. 4. Direct gear drive — No mechanical clutches. 5. Sufficient reserve capacity for 1½" or 2½" lines even with fog guns in operation.

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AMERICAN-MARSH PUMPS

BATTLE CREEK MICHIGAN

Only the GRAVELY does so many City Jobs so well!

Solve your city lawn and maintenance problems—and save time and money too! . . . The powerful 5-HP. Gravely Tractor does 20 jobs faster, better, easier! 20 tools to choose from for your particular needs, all powered by the same rugged, dependable tractor!

All-gear drive, power reverse, city-tested for 30 years!

"Power vs Drudgery" tells how Gravely POWER solves your city upkeep and maintenance problems fast! Write for it today!

Gravely Motor Plow & Cultivator Co.
BOX 173 DUNBAR, WEST VIRGINIA

Bronze Tablets...
By Cincinnati's Famous Metal Craftsmen

Memorials ● Honor Rolls
Portrait Tablets ● Signs
Markers ● Name Plates

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Tell us what you have in mind and we'll gladly submit suggestions.

MEIERJOHAN • WENGLER
1102 W. 9th St. CINCINNATI 3, OHIO

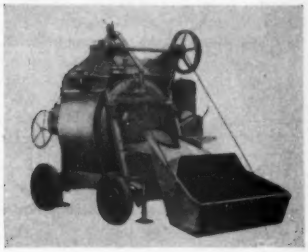
FOR SALE

Two New 400-hp Westinghouse Vertical Motors. 2200-volt, 3-phase, 60-cycle. Weatherproof construction, including Thermoguards.

Write - Wire - Phone

SONKEN-GALAMBA CORPORATION
2nd and Riverview (X-682)
Kansas City 18, Kansas
THatcher 9243

Improvements in Concrete Three-Bag Mixer



The Kwik-Mix Co. of Port Washington, Wis., has announced improvements affecting the design and performance of a new-heavy-duty type Model 16-S concrete mixer. A subsidiary of the Koehring Co., of Milwaukee, Kwik-Mix is a pioneer manufacturer of concrete, plaster-mortar, and bituminous mixers and the Moto-Bug, a heavy-duty power wheelbarrow.

In construction features, the new three-bag mixer is designed with heavier frame sections, coil spring mounting, and cast steel drum heads with machined roller paths. The 27-hp gasoline engine is equipped with a clutch, and contact points on each end of the charging skip supporting bar are provided for the selective skip shaker to produce a quick, positive vertical action.

The new model is interchangeable and can discharge from either side or end. The Kwik-Mix tower loader attachment for loading trucks or depositing concrete at higher levels can be attached to the new mixer as an optional unit.

Additional information and detailed specifications on the new Kwik-Mix Model 16-S may be obtained from any Kwik-Mix distributor or by writing to the manufacturer.

Named Sales Manager

According to an announcement by Harlowe Hardinge, president of the Hardinge Co., Inc., 240 Arch St., York, Pa., Robert J. Russell has been appointed sales manager. Also secretary of the firm, Mr. Russell had been chief of the technical staff.

Joining the firm in 1929 as a service engineer, he spent several years in field erection and servicing and then specialized in the design and development of wet and dry grinding systems. More recently, he has become an authority on the design and application of continuous drying equipment.

As sales manager, Mr. Russell will supervise all Hardinge sales personnel, sales engineering of all equipment and processes for mining, metallurgical, chemical, stone products, ceramics, water, sewage, and industrial waste applications.

As a contributing author, he wrote chapters on drying and dryers for two textbooks.

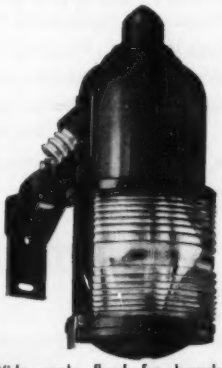
Revere ELECTRIC MFG. CO. CHICAGO, U.S.A. EQUIPMENT for Protective Lighting

NIGHT FLOODLIGHTING
forms a basic security pattern for all public property

WATER WORKS
ELECTRIC POWER PLANTS
GAS PLANTS
BRIDGES
PUBLIC BUILDINGS
VIADUCTS, ETC.

Write us at once in the interests of security

SEARCHLIGHTS at Strategic Points Provide *guards with a clear view of surrounding area.*



Wide angle flood for boundary lighting. Used extensively at shell loading plants and arsenals.

VIADUCT and TUNNEL LIGHT *for Wall Mounting*

Refracting Lens throws beams directly on road or passageways

ELIPTOR FLOOD

750
1000
1500
Watt

HINGED STANDARDS
For street lighting do away with expensive servicing

A full line of luminaires; also finishing rings for use with sealed beam lamps.

REVERE ELECTRIC MFG. CO.
6015 BROADWAY — *Indoor and Outdoor Lighting Equipment for Every Need* — CHICAGO 40, ILL.

What is 3-AXLE SMOOTHNESS?

The answer to this question is a matter of record. By actual test, it is the highest degree of road surface smoothness ever attained with tandem roller. A leading state highway department proved that the Buffalo-Springfield 3-axle tandem produces surfaces 50% smoother than the average obtained with conventional tandems of equal capacity. Also noteworthy, the same test showed that the 3-axle tandem averaged 60% more tonnage compacted than other units on the project. As a result, the specifications for asphaltic surfaces in this state now permit the use of one less tandem roller with each spreader, *provided* a 3-axle tandem is one of the rollers employed.

Still another state specifically requires the use of a 3-axle tandem on certain plant mix surfaces.

There's a reason for this greater work capacity and smoother rolling results. The two large diameter guide rolls and the drive roll of the 3-axle tandem are rigidy mounted in a position tangent to the same plane. Thus, when one guide roll strikes a high spot in the pavement, the other is lifted clear of the surface and its weight transferred to the rolls retaining surface contact. Result — maximum compactive effort where it is needed most — on the high spots in the surface.

You can learn more about this transfer-of-weight principle and the many other exclusive features of the Buffalo-Springfield Model KX-25, 12 to 19 ton, 3-axle tandem from your nearest distributor. Why not call him today?

Mail This Coupon Today

THE BUFFALO-SPRINGFIELD ROLLER CO.
Dept. H-2, Springfield, Ohio

☐ Please send me Catalog S-56-49 describing the right model for my requirements. ☐ Notify Distributor to call.

NAME .....

ADDRESS .....

CITY ..... STATE .....

BUFFALO SPRINGFIELD
THE STANDARD OF COMPARISON
SPRINGFIELD, OHIO

Byron Jackson Appoints

The appointment of Dean De Graffenreid to the post of district sales engineer for the Tulsa, Okla., office of the Byron Jackson Co. has been announced by Lynn Sawyer, vice-president of the concern.

D. De Graffenreid

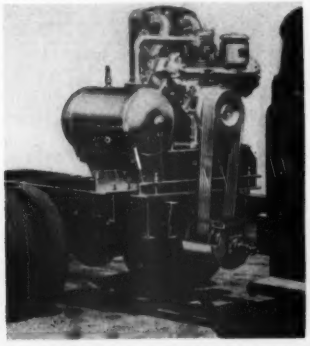
Mr. De Graffenreid's career with Byron Jackson commenced in 1947, when he became a test engineer for the pump division. He was transferred in 1948 to the Los Angeles sales department and to the division office in Tulsa in May, 1950.

New Compressor Powered By Truck Engine

The Jaeger Machine Co., 505 Dublin Ave., Columbus 16, Ohio, announces a new Model 125 compressor. This device, which mounts on any of five makes of 1½- and 2-ton rated trucks, derives its power directly from the truck engine through a simple, but rugged power-takeoff. Automatically dispensed with are the need for and the expense of separate compressor engine and engine cooling system, engine-to-compressor clutch, trailer unit, fuel tank, battery, and towing hitch. Maintenance costs receive drastic cuts, since care and replacement of extra equipment is thus eliminated.

The compressor, which furnishes 125 cubic feet per minute of 100-pound air, is capable of driving two heavy-duty pavement breakers at full 90-pressure right at the tools. Its power-takeoff unit contains no gears and directs power to the compressor through v-belts by way of a solid-shaft type clutch. Two simple levers in the truck cab control all functions, and truck engine speed is automatically regulated during compressor operation.

Write for Bulletin TC-1.



This simplified power-takeoff is the driving force behind the Jaeger "Travel-Air" compressor.

New Adams Motor Grader

Production of its new 70-hp International diesel-powered motor grader No. 312 has been announced by the J. D. Adams Mfg. Co., Indianapolis, Ind.

The grader, which weighs from 18,285 to 19,800 pounds, depending on equipment, carries 12,800 pounds on its rear wheels, providing ample traction to take full advantage of the 70-hp engine. Other features of the No. 312 are a full-floating rear axle, eight overlapping forward speeds, fast mechanically operated controls, 12-foot blade, and high-arch front axle. Optional equipment includes hydraulic-mechanical power steering, V-type snow plow, snow wing and bulldozer.

District Manager

P. B. "Pete" Erwin has been appointed district manager of the Los Angeles branch office of the Enterprise Engine and Machinery Co., 18th and Fla. Sts., San Francisco 10, Calif.

P. B. Erwin

Mr. Erwin will have his headquarters at 5701 S. Boyle Ave., Los Angeles, Calif.

★ Hot Applied Tar Base Coatings
★ Cold Applied Tar Base Coatings—Series 100
★ Alkyd Base Coatings—Series 200
★ Chlorinated Rubber Base Coatings—Series 300
★ Vinyl Base Coatings—Series 400
★ Phenolic Base Coatings—Series 500

Protective Coatings Booklet
Now Available

Booklet containing specific information on Pitt Chem Protective Coatings will be sent upon request.

See Your Nearest Pitt Chem Man

PROTECTIVE COATINGS DIVISION

W&D 3417

PITTSBURGH COKE & CHEMICAL CO.
GRANT BUILDING, PITTSBURGH 19, PA.

OFFICES: New York • Chicago • St. Louis • Tulsa • Houston • Los Angeles • San Francisco

Attend the N.A.C.E. Convention in New York City, March 13th to 16th

TRAFFICONES *were shipped* LAST MONTH to

Plain $4.95 each
Lettered $5.60 each

$2.40 each

Abilene, Texas
Albuquerque, New Mexico
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Daytona Beach, Florida
Dennison, Texas
Denver, Colorado
Dillon, Montana
East Chicago, Indiana
Findlay, Ohio
Freeport, New York
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High Point, N. C.
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Houston, Texas
Indianapolis, Indiana
Jonesboro, Arkansas
Kernerville, North Carolina
Kermit, Texas
Los Angeles, California
Milwaukee, Wisconsin
Montreal, Canada
New Orleans, Louisiana
New York Port Authority
North Carolina Highway Dept.
Orange, New Jersey
Orangeburg, South Carolina
Philadelphia, Pennsylvania
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Portland, Oregon
Pueblo, Colorado
Raleigh, North Carolina
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Sedalia, Missouri
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231 W. OLIVE AVE., BURBANK, CALIF.

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MEETS THE SPECIAL NEEDS OF EVERY CITY WITH THE RIGHT METER FOR THE PURPOSE

The "First Family" of Parking Meters

WRITE FOR FULL DATA TO THE KARPARK CORPORATION, CINCINNATI 6, OHIO

THE WISE CHOICE

The Steel Head SUPERIOR
Supreme in strength; in resistance to damage and vandalism.

The Low Cost HUSKY
Makes Karpark dependability available at a minimum investment.

The Versatile TWIN-O-MATIC
One installation times two cars; has every wanted feature.

The Adaptable UNIMATIC
Takes care of any parking situation—beautifully and efficiently.

Assistant Sales Manager

W. R. Smith has been named assistant sales manager of The Buffalo-Springfield Roller Co., Dept. H-1, Springfield, Ohio. He will work with Murray D. Shaffer, director of sales, in promoting the firm's complete line of portable tandem and three-wheel rollers.

W. R. Smith

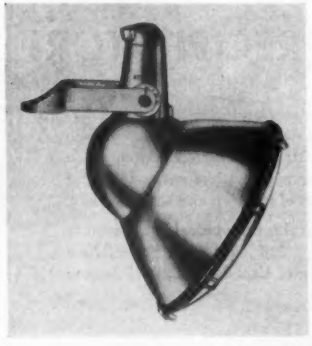
Announcement of the appointment was made by Edward E. Greiner, vice-president of the company.

Standby Power Assured

A right-angle gear drive connected with a vertical pump that is electrically powered is insurance against the lapse of power through a transmission line breakdown or other causes. These drives make it possible for the pumps to receive standby power from a gasoline or diesel engine, and thereby guarantee continuous 24-hour service. These are adaptable for sewage pumping stations, or for water pumping. They are available in sizes, types, and ratios to meet varied applications.

Manufacturer of this machine, Johnson Gear and Mfg. Co., is located at 8th and Parker Sts., Berkeley 10, Calif.

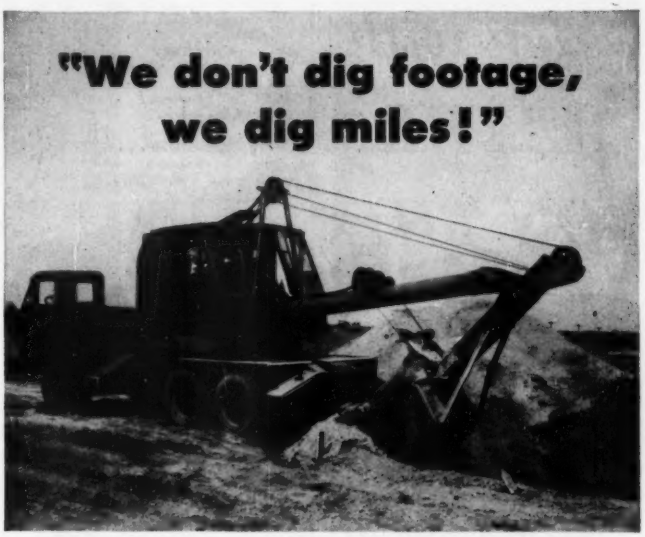
"Sportsliter" Floodlight



A new 18½-inch reflector, Alzak aluminum floodlight, is offered by the Steber Mfg. Co., Broadview, Ill.

Known as "Series 4000," this new unit is available in open or enclosed type in narrow or medium beam. Open types can be stocked with lens and fittings separately to provide local stocks to take care of any urgent installation from a low-cost inventory.

Illustrated folder No. 127-50, with typical layouts for all types of sports areas, is available on request to the Steber Mfg. Co.



Yes . . . George McDonnell, operator, says that's what they do at Levittown Housing Development with the MICHIGAN ½ yd. Truck Excavator owned by Levitt & Sons, Inc.

"We move all over the field with it," states McDonnell, "and run back and forth to Roslyn, about thirteen miles in only an hour. The MICHIGAN is easy to operate, too — after all, you have air to do the work."

And when it comes to service, Construction Equipment Corp., Long Island City, MICHIGAN dealer, rates "tops" with McDonnell.

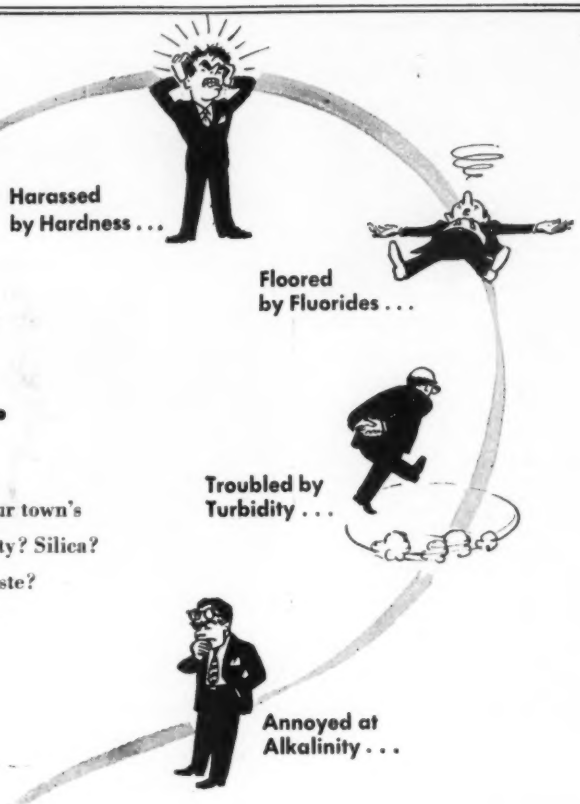
Martone Sewage Disposal Co., subcontractor at Levittown, has a MICHIGAN ⅜ yd. Truck Excavator. Mr. Martone states: "We can get it in and out of small places easily. It does a *lot* of work!" James Pepe, operator, volunteered: "I've run MICHIGANS for years. They're the easiest to operate."

These opinions of MICHIGAN Excavator-Cranes are typical from profit-wise contractors. When you need an excavator-crane . . . investigate *MICHIGAN* . . . you'll agree it's *your best buy*. Write, wire or phone for details.

MICHIGAN POWER SHOVEL COMPANY

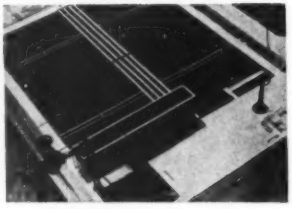
373 Second Street, Benton Harbor, Michigan, U. S. A.

Men with WATER ON THE BRAIN . . .



Is there something wrong with your town's water supply? Hardness? Turbidity? Silica? Alkalinity? Fluorides? Color? Taste? Odor? If you are plagued by any one of them, it's a good idea to specify Permutit water conditioning equipment.

— *should know about the* PERMUTIT PRECIPITATOR!



The Permutit Precipitator brings you a new and more efficient means for removing impurities from water. It does this by precipitation, adsorption, settling and upward filtration. Its sludge blanket is kept fresh and active at all times. The Precipitator requires less space, less time and less chemicals than previous designs of reaction and settling tanks.

Write today for full information about this economical equipment to The Permutit Company, Dept. AC-2, 330 West 42nd Street, New York 18, N. Y., or to Permutit Company of Canada, Ltd., 6975 Jeanne Mance Street, Montreal.

Water Conditioning Headquarters for Over 37 Years

PERMUTIT

100,000th Truck of Year

All peacetime production records were shattered as GMC Truck and Coach Division rolled out its 100,000th truck of 1950, surpassing the former mark of 92,677 units produced in 1948. General Manager Roger M. Kyes (left) and J. E. Johnson (center), general sales manager, watch as factory manager, F. R. Falberg, rides the history-making vehicle, a Model 650 GMC diesel, off the assembly line at Pontiac, Mich.

92-Pound Portable Conveyor Handles 25 Tons an Hour

A lightweight portable conveyor 16 or 20 feet long and capable of being set at any angle up to 45 degrees is offered by The Belt Corp., Orient, Ohio. Its purpose is to speed up loading, unloading, and moving cinders, sand, gravel, coal, salt, bulk chemicals, and any other materials which are unpleasant and expensive to do by hand. One man sets it up and sees that the job is done.

Drive is by either electric motor or gasoline. Stripped of power unit, the conveyor weighs only 92 pounds. Handling capacities are 11 to 14 tons of material per hour at an operating angle of 35 degrees. Using a higher speed motor can provide a capacity of 18 to 25 tons per hour if desired. A folder giving complete information is available.

LOCATE HIDDEN VALVE BOXES, *surveyor's stakes, manhole covers, septic tanks...*
with the "AQUA VALVE BOX LOCATOR"
....quickly, easily, cheaply!

$29.50
F.O.B. CIN., O. with fine leather case

Thousands are used by Water Dept. and Gas Co. men and surveyors. Instant top-view periscope reading. Rubber-mounted cobalt steel dipping needle guaranteed for ten years. Accurate in ice and snow in all terrain. Also serves as a rugged accurate compass.

Time and trouble saved in finding just one valve box could pay for it. Send for complete illustrated description. Ask about 15 day FREE TRIAL.

AQUA SURVEY & INSTRUMENT CO.
2518 LESLIE AVENUE, CINCINNATI 12, OHIO

Manufacturers Representative:

Sewer Cleaning Machinery Valuable Territory Openings

Please state lines you now handle, territory covered and your method of operating.

Address inquiry to

Box No. 341
The American City Magazine
1719 Daily News Bldg.
Chicago 6, Ill.

KILL INSECT PESTS with
IRON AGE
MIST SPRAYERS

Users everywhere praise the performance of Farquhar Iron Age Mist Sprayers on golf courses, parks, playgrounds, swimming pools, tourist courts, picnic grounds, and other places where insect pests are a problem.

Here are the outstanding features of the Farquhar Iron Age Model 125: 22 hp, 4 cylinder Wisconsin engine drives sturdy cast aluminum axial flow fan at 87% efficiency, delivering 6,000 to 11,000 cubic feet of air per minute at 90 to 125 mph. New, efficient spray jets meter *exactly* the right amount of mix, either oil or water, to center of high velocity air stream, insuring complete misting of concentrate. Spray jets can be changed quickly to alter droplet size. Turret rotates 360° for full control of air blast. 125 gallon tanks are available with trailer or skid mounting. Comfortable spring seat for operator.

Find out *now* how Farquhar Iron Age Mist Sprayers can make your pest control program *far more effective at less cost.*
Write A. B. FARQUHAR COMPANY, 3536 Duke St., York, Penna.

Farquhar
IRON AGE
YORK, PA.
POTATO AND VEGETABLE PLANTERS • TRANSPLANTERS
SPRAYERS • DUSTERS • POTATO DIGGERS • WEEDERS
MANURE SPREADERS • CONVEYORS • JUICE PRESSES

PLANT AND SPRAY THE IRON AGE WAY

IN ARAPAHOE COUNTY (Littleton) COLORADO

AUTOMATIC VOTING MACHINES GIVE PROMPT RETURNS

A NEWSPAPER ACCOUNT OF THE PRIMARY ELECTION IN ARAPAHOE COUNTY ON SEPT. 12, 1950 STATES—

"Trying out the machines for the first time, Arapahoe County tabulators turned out courthouse lights and went home at 11 p.m., a full twenty-four hours earlier than tabulations were completed in the last Primary Elections."

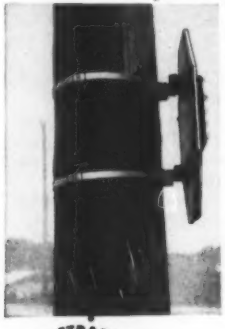
AUTOMATIC VOTING MACHINE CORPORATION

"BUILDERS OF VOTING MACHINES SINCE 1898"

JAMESTOWN, NEW YORK

STEEL STRAPPING

FOR ATTACHING SIGNS



The A. J. Gerrard Strap Man would be pleased to show you how you can stretch your budget for sign maintenance.

Savings can be made with either Stainless Aluminum, or Galvanized Brackets, Seals, and Strap.

Write for full information, and the name of the nearest Strap Man who will gladly demonstrate the A. J. Gerrard Improved Methods.—No obligation.

SS-3

STEEL STRAPPING

A. J. Gerrard & Co.

1952 HAWTHORNE DRIVE • MELROSE PARK, ILL.
(Chicago Suburb)

A STATEMENT OF ADVERTISING PRINCIPLES

1. Good Advertising— aims to inform the consumer and help him to buy more intelligently.

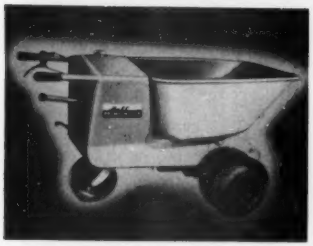
2. Good Advertising— tells the truth, avoiding misstatement of facts as well as possible deception through implication or omission. It makes no claims which cannot be met in full and without further qualification. It uses only testimonials of competent witnesses.

3. Good Advertising— conforms to the generally accepted standards of good taste. It seeks public acceptance on the basis of the merits of the product or service advertised rather than by the disparagement of competing goods. It tries to avoid practices that are offensive or annoying.

4. Good Advertising— recognizes both its economic responsibility to help reduce distribution costs and its social responsibility in serving the public interest.

Advertising Federation of America

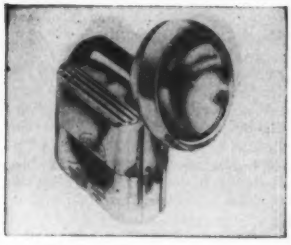
Powered Wheelbarrow Saves Time, Money, Effort



The improved Model 15 powered wheelbarrow, product of the Prime-Mover Co., Muscatine, Iowa, can be put to work on all types of material-handling jobs to save minutes, money, and manpower.

This redesigned and improved model includes such new features as forward direct drive with half-speed reverse under power, constant mesh transmission, conveniently-placed operator's controls, and concealment of the engine and gasoline tank in enclosed panels, protected from floor dirt. Two sizes of platforms with stakes are quickly interchangeable with the bucket, and capacity has been increased to 1,500 pounds, bucket or platform load. The barrow, which has 31½-inch width to permit easy access through doorways and elevators, can take steep ramps and withstand continuous heavy-duty use, indoors or out.

All-Weather Lantern Lamp



An all-glass sealed-beam type lamp for use in an all-weather electric lantern, ideal for use by firemen and policemen, has been developed by the Westinghouse Lamp Division, Bloomfield, N. J.

Although it employs the same size battery as an ordinary hand lantern, this lantern lamp's 5,500-beam candlepower is twice that of the conventional type. The entire lantern unit, listed at $7.25 plus battery and tax, weighs only 44 ounces, features high optical precision and a clear lens for spotlighting purposes. The lamp alone is $2.50 plus tax, and a larger case, having space for a spare battery, sells for $10.95.

HAISS Material Handling
BUCKET LOADERS

FOUR MODELS
Load 3 to 8 Yards per min.
Self-Propelled
Self-Feeding

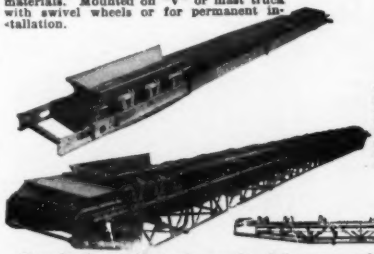
For loading: sand, gravel, stone, top-soil, coal, snow and similar materials. One-man operation, wheel or crawler mounted. Furnished with swivel chute or with swivel belt conveyor.

Special new features include: Sealed anti-friction bearings on head and tail shafts, two or four wheel drive, hydraulic raising and lowering, manganese or roller chain.

HAISS CONVEYORS
CAR UNLOADERS

Flat and Trough Belt Conveyors
For handling all types of loose or package materials. Mounted on "V" or mast truck with swivel wheels or for permanent installation.

UNDERCAR UNLOADERS
Designed and built especially for loading sand, gravel, and crushed stone. Combination belt and positive chain drive. Capacity up to 5 tons per minute. Ask for bulletin No. 501.



SECTIONAL CONVEYORS
Channel or Lattice Frame construction. Made in easily assembled standard sections for permanent or portable installation. All sizes and capacities available for handling all types of aggregates as well as barged or packaged materials.

For further information write, 'phone or wire. Experienced Haiss Representatives are located in all principal cities.

George Haiss Mfg. Co., Inc. division of Pettibone Mulliken Corp.
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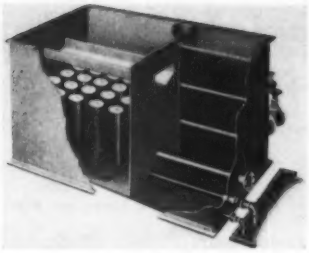


Diatomaceous Earth Filter Betters Swimming Pool Performance

Swimming pool designers have four types of filter available for their choice: pressure sand filters, vacuum sand filters, pressure diatomite filters, and vacuum diatomite filters. The Watertite Co., Omaha, Nebr., reports that the latter is fast becoming the preferred type of installation, both because of cost and the improved quality of water it produces.

The vacuum diatomite filter manufactured by this company consists of an open steel tank divided into two sections. One section is the pre-filter stilling chamber equipped with a screen to remove large particles. The other section is the main filter chamber which contains a distributor-collector system, the filter elements, and an air-wash mechanism.

In actual operation, water from the pool floods the filter and passes first into the pre-filter chamber where particles of semi-floating matter, such as leaves and twigs are removed. It then passes into the main filter chamber through the distribution trough. A pump, connected to the bottom collector manifold, draws the water through the diatomaceous earth-coated filter elements and discharges it to the pool, crystal clear and free from turbidity, through the pool distribution system.

New Dry-Type Transformers

Some of the latest features of the oil-filled distribution transformers together with proper adjustment for cooling and moisture protection have now been incorporated in Line Material Co.'s line of dry-type transformers. These transformers serve lighting loads from power distribution circuits rated 240, 480, and 600 volts.

Round wound construction provides cooler operation, reduced size and weight, ruggedness and long life, efficient characteristics and better regulation. Moisture-resistant insulating materials are vacuum impregnated with a heat-resisting insulating varnish. These transformers meet the requirements of NEMA standards for "Specialty Transformers." The 1½ through 10 kva sizes have been approved and accepted by Underwriters Laboratories, Inc.

For further information, write Line Material Co., Milwaukee 1, Wis., and ask for Bulletin DT-7.

Fluoridation Factors in Dental Health

The element, fluorine used in the fluoride form, is proving to dental, medical, and other fields its ability to reduce dental trouble, particularly in children's teeth when applied in drinking water, according to Wallace & Tiernan Company, Inc., of Newark, N. J. In its recent issue of *Chlorination Topics*, the company outlines some of the highlights of these developments.

Maximum tooth protection, it records, is afforded when the drinking water contains fluoride in amounts ranging from 1.0 to 1.5 ppm. Smaller amounts afford little if any protection. Amounts greater than six ppm offer the danger of mottled teeth.

Fluorine is present in water only in the form of a salt, generally sodium fluoride, and not as the free element, fluorine. It may be added to water directly as sodium fluoride or as an acid, such as hydrofluosilicic acid which reacts with the water to form fluoride. It can be applied to water in powder or liquid form. Sodium fluoride or sodium silicofluoride are generally used in powder form because of their non-corrosive nature. Hydrofluosilicic acid, relatively non-corrosive and easy to handle, is often used also. Hydrofluoric acid, highly corrosive, is used only rarely. Feeding of sodium fluoride, sodium silicofluoride or hydrofluosilicic acid is not greatly different from feeding any common water-works chemical. The company recommends Wallace and Tiernan dry chemical feeders and solution feeders.

For the small water works, it recommends the solution feeder that can be synchronized with intermittent pumping action.

For the medium-sized plant up to five mgd, the company recommends the Type N-A dry chemical feeder. This feeder was originally developed to feed enriching concentrates in the flour-processing field, and can feed with extreme accuracy. These can be mounted on platform scales.

This new dry-type transformer serves lighting loads from power distribution circuits rated 240, 480, and 600 volts.

Direct Positive Copies Made by New Machine

The first machine specifically designed to make low-cost direct positive copies anywhere in a business office is the BW Copyflex, reports the manufacturer, the Charles Bruning Co., Inc., 100 Reade St., New York 13, N. Y. The firm says that this machine is the answer to the need of modern business for a quick, clean method of privately making low-cost error-proof copies.

The new device uses the BW Diazo process, a method which has been employed by copy departments of industry and business for making exact contact prints of letters, records, and reports.

BW Copyflex needs no inks, tray developing, dark rooms, subdued or special lighting, stencil, and has no annoying fumes. No stencil, negative, or special training is required.

The machine copies any size of original matter up to 11½ inches wide by any length. It needs no installation and can be placed anywhere in an office merely by connecting it to the ordinary office electric light line carrying standard 60 cycles, 110 volt alternating current. It is 29½ inches wide, 28 inches deep, and 50 inches high.

Awards Will Be Made To Engineering Students

M. T. Singleton of Wiedeman and Singleton, consulting engineers, Candler Bldg., Atlanta, Ga., will serve as judge of the Southern District in the 1951 "Eschenbrenner Awards," sponsored by the Universal Concrete Pipe Co., Columbus, Ohio.

Three awards in the amount of $500 each will be made to senior civil engineering students in colleges and universities east of the Mississippi River for the best papers on non-monolithic concrete product. April 1, 1951, has been set as the deadline for entries.

H. L. Byrd W. L. Campbell

Elected Vice-Presidents

The Food Machinery and Chemical Corp., P. O. Box 760, San Jose, Calif., at a board of directors' meeting elected as vice-presidents, Hubert L. Byrd, Clifford K. Wilson, and Professor William L. Campbell.

Mr. Byrd is manager of FMC's John Bean Division, with headquarters at Lansing, Mich. This division produces agricultural spraying equipment, high-pressure fog fire fighting machines, and automotive service equipment.

Mr. Wilson is manager of the firm's Sprague-Sells Div., Hoopeston, Ill.

Head of the food technology department of the Massachusetts Institute of Technology, Professor Campbell as a FMC vice-president will assume executive duties at the company's home office in San Jose, Calif.

Sickle Bar Mower

A new single-purpose sickle bar mower, weighing 139 pounds and costing $139.50 f.o.b. factory, is reported by the George Tractor Division, Community Industries Assoc., Sullivan, Ill. The design includes two clutches, one for the sickle bar and the other for the traction drive. Rubber-mounted handles limit vibration to the chassis, and roller bearings and heavy-duty balloon tires create an easy, smooth operation.

Control of the independent sickle bar drive is hand located at the rear base of the motor and is operated by hand. The mower clutch is spring-loaded to protect the cutting knives from damage. The traction-drive's control is mounted at the handle bar and the clutch is adjustable for pressure.

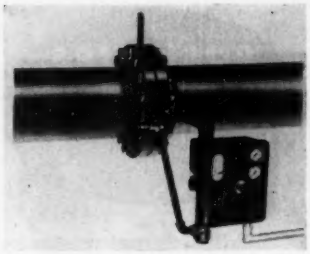
For complete information about the new George sickle bar mower, which has a 1½ to 2-mile-an-hour speed, write to the manufacturer.

Precision Flow Transmitter

The Fischer and Porter V/A Cell is a new, precision-flow transmitter developed for differential pressure applications. Basically a through-flow instrument of the variable-area type, it measures a by-passed portion of the main-line flow. Continuous self-purging is thus provided. It features high accuracy with a wide-range, linear scale.

The V/A Cell is applicable to services on liquids, gas, and vapor streams.

Further information can be obtained by writing Fischer & Porter Co., 42 County Line Road, Hatboro, Pa.



The V/A Cell Kinetic Manometer, a compact flow indicator and transmitter unit.

IN CHLORINATION...

...the SIMPLE Way is the BEST Way!

Here's chlorination that's *extra easy*. Plants that use Builders Visible Flow Chlorinizers profit in many ways by their unique simplicity. These chlorine gas feeders are *easy to understand, easy to operate, easy to service*. Chlorination — whether manual, semi-automatic, program, or flow-proportional — is a safe, dependable operation when it's handled by Builders Chlorinizers. They are easily serviced by any competent mechanic and individual parts and sub-assemblies are easily replaceable. For complete information and Bulletins, address Builders-Providence, Inc. (Division of Builders Iron Foundry), 358 Harris Ave., Providence 1, R. I.

BUILDERS PRODUCTS

The Venturi Meter • Propelofio and Orifice Meters • Kennison Nozzles • Venturi Filter Controllers and Gauges • Conveyaflo Meters • Type M and Flo-Watch Instruments • Wheeler Filter Bottoms • Master Controllers • Chlorinizers — Chlorine Gas Feeders • Filter Operating Tables • Pneumatic Meters • Chronoflo Telemeters

Installation at R. I. State Sanitarium, Wallum Lake, R. I.

BIF INDUSTRIES BUILDERS-PROVIDENCE BUILDERS

. . . with a
GREENLEE PIPE PUSHER

Speed jobs with this quick, simple way to install underground pipe. With the GREENLEE *one man* pushes pipe under obstacles . . . no tearing up of pavement, floors, lawn . . . eliminates extensive ditching and tedious backfilling! Two models and special power pump to fit your various jobs. Write for facts today.

GREENLEE

Greenlee Tool Co., 2022 Columbia Ave., Rockford, Ill.

THE **MODERN** LAWN MOWER **SHARPENER**

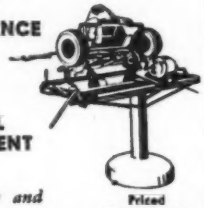
CUTS MAINTENANCE COSTS

•

LOWER CAPITAL INVESTMENT

•

Economically and Quickly Sharpens All Municipal Mowers



Priced **$241.50** (less motor)

Sharpens All Reel Type Mowers • Hand, Power or Gang • 10 to 20 Minutes • No Dismantling No Extra Attachments Needed

All reel type mowers, from 5-inch edgers to 36 inch power mowers, are quickly sharpened to extreme ends of both left and right twist reel blades. Handle, wheels, roller and motor repair in place when sharpening is in process. Bed knife is sharpened in same brackets that hold mower in grinding position. No extra attachments required. One lever puts mower or bed knife in grinding position. 100% steel construction. Grinding head rides on five ball bearing races. Small, compact, easy to operate. Sharpens wood chisels, joiner knives and planer blades without extra attachments. Skate Sharpener Attachments available.

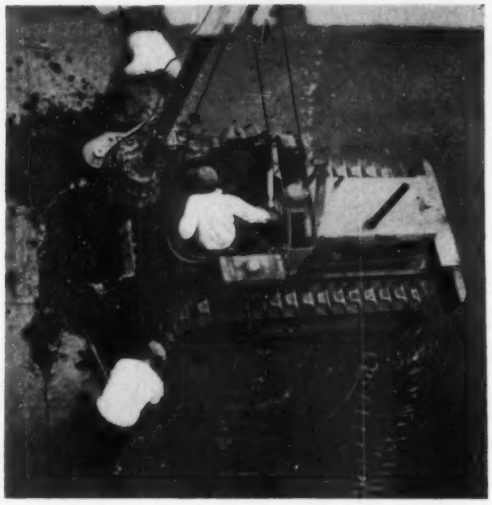
1/3-hp. G.E. 60-cycle Motors now available—$21.50 extra.

Send for Free Bulletin No. 258

ORDER NOW • IMMEDIATE DELIVERY

MODERN MFG. CO.
140 N. FAIR OAKS AVE. • PASADENA 1, CALIF.

Power Auger for Power Poles



This tractor-auger combination for digging post holes, consisting of a post-hole digger made by the Highway Trailer Co. of Edgerton, Wis., powered by the rear power take-off of a Caterpillar diesel D2 tractor, is now being used by the municipally-owned Knoxville Utilities Board, Knoxville, Tenn., for digging 8½-foot holes for power poles. A similar device has been used by the Louisville, Ky., Water Co. to dig pits for water meter boxes.

Diesel Engine Manufacturers Elect Officers and Directors

Election of officers and directors for 1951 was held recently at the annual meeting of the Diesel Engine Manufacturers Association in Chicago. Harvey T. Hill was reappointed executive director of the Association.

The new staff includes: president, Otto H. Fischer, president of The Union Diesel Engine Co., Oakland, Calif.; vice-president, A. W. McKinney, executive vice-president of The National Supply Co., Toledo, Ohio; vice-president, Marvin W. Smith, president of Baldwin-Lima-Hamilton Corp., Philadelphia, and treasurer, Robert H. Morse, Jr., president of Fairbanks, Morse & Co., Chicago.

Directors are: William E. Butts, president of the Enterprise Div. of General Metals Corp., San Francisco; Levin H. Campbell, Jr., executive vice-president of International Harvester Co., Chicago; C. Paul Clark, president of Clark Bros. Co., Inc., Olean, N. Y.; George W. Codrington, vice-president of General Motors Corp., Cleveland, and M. C. Davison, vice-president of Ingersoll-Rand Co., New York.

Also, Robert E. Friend, president of Nordberg Mfg. Co., Milwaukee; Gordon Lefebvre, president of The Cooper-Bessemer Corp., Mount Vernon, Ohio; William S. Morris, vice-president of American Locomotive Co., New York, and E. J. Schwanhausser, executive vice-president of Worthington Pump and Machinery Corp., Harrison, N. J.

American Vacuum Leaf Loader
Solves your leaf or clean-up problem

Write for leaflet

LEAF LOADER DIVISION
American Structural Steel and Tank Co.
21050 W. 8 MILE ROAD DETROIT 19, MICH.

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Architects—Engineers—Specialists for 25 years
Swimming Pools, Ice Rinks, Recreation Parks, New Designs, Surveys, Plans and Supervision.
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Correspondence Invited
200 Chestnut Street — Swarthmore, Pa.

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Mechanical—Civil—Electrical
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65 McCall Place
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Organized to assist municipalities and public groups in utility valuations, rates, franchises, accounting and surveys.
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Consulting Engineers Organized—1907
Electric Power, Water Works, Sewerage, Paving, Reports, Designs, Supervision.
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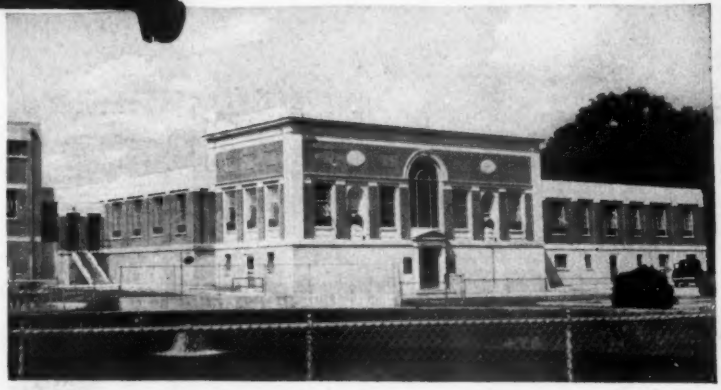

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